PRECISION IMPEDANCE ANALYZER
6500B Series

Remote Control Commands
User Manual

Issue B draft

ILLUSTRATIONS

1. REMOTE CONTROL

The 6500B series of instruments may be remotely controlled using the General Purpose Interface Bus (GPIB) or a Local Area Network (LAN). This chapter describes the interface specification and the command structure for both forms of remote instrument control.

1.1 GPIB Interface

1.1.1 Introduction

The General Purpose Interface Bus (GPIB) is a parallel port designed to be used for communication between instruments and control devices such as PCs fitted with a suitable interface card.

The GPIB interface is used where relatively local control and data logging of an instrument is required. For extended operating distance and a reduction in computer costs consider using the industry standard LAN (Ethernet IEEE802.3) control port.

1.1.1.1 Interface Specification

The IEEE 488.1 bus standard and the IEEE 488.2 code standard are fully supported. The structure of the command set broadly follows the SCPI standard.

SH1	Full source handshake
AH1	Full acceptor handshake
T6	Basic talker, serial poll, no talk only, untalk if MLA
TE0	No talker with secondary addressing
L4	Basic listener, no listen only, unlisten if MTA
LE0	No listener with secondary addressing
SR1	Full service request
DC1	Full device clear
RL1	Full remote/local compatibility
PP0	No parallel poll
DT1	Full device trigger compatibility
C0	No controller

Table 1-1 IEEE 488.1 Supported Functions

1.1.1.2 GPIB Address

Each instrument on the GPIB bus requires a unique address within the range 1 to 16.

The default address for this 6500 is 6 and is stored in non-volatile memory. This may be changed in the S**ettings** page found in the **mode** menu item in Meter or Analysis mode.

1.2 Remote Programming

1.2.1 Remote Messages and Commands

A remote message is made up of one or more commands. Remote commands are divided into two groups.

- Common commands – These commands query/change the instrument's status, e.g. querying the status groups or identifying the instrument.
- Subsystem commands – These commands are used to query/control the instrument's function, e.g. to change frequency or perform measurements.

1.2.1.1 Command Strings

Command strings are the basic form of communication with the instrument. Command strings can contain one or more individual commands. A semicolon is used to separate multiple commands within one command string. The linefeed character and/or asserting EOI *(GPIB only)* terminates the string. Once a string has been received all the commands it contains are executed in the order that they occur within the string from left to right. Command strings are not case sensitive.

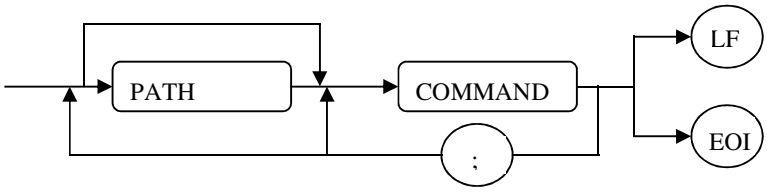

Figure 1-1 Remote Message Structure

Example:

Set the frequency and level in meter mode:

```
:METER:LEVEL 0.5;:METER:FREQ 1E4<lf>
```

1.2.1.2 Paths

Subsystem commands are accessed via a command path. Paths group the instrument commands into related categories to ease programming. The paths are defined in a tree structure:

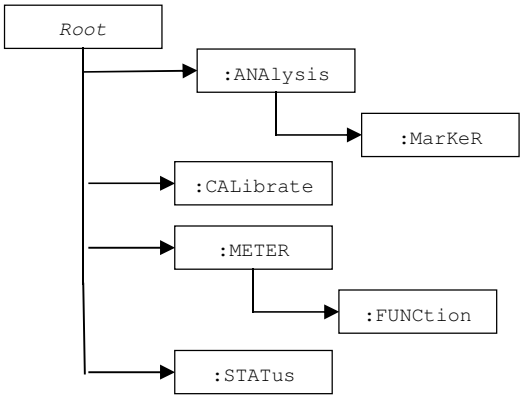

Figure 1-2 Command Paths

For example to access the marker sub system command to move the marker right:

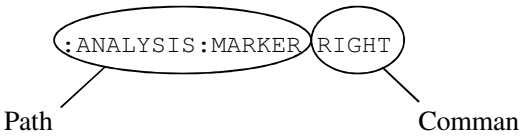

Figure 1-3 Command Path Example

1.2.2 Command Structure

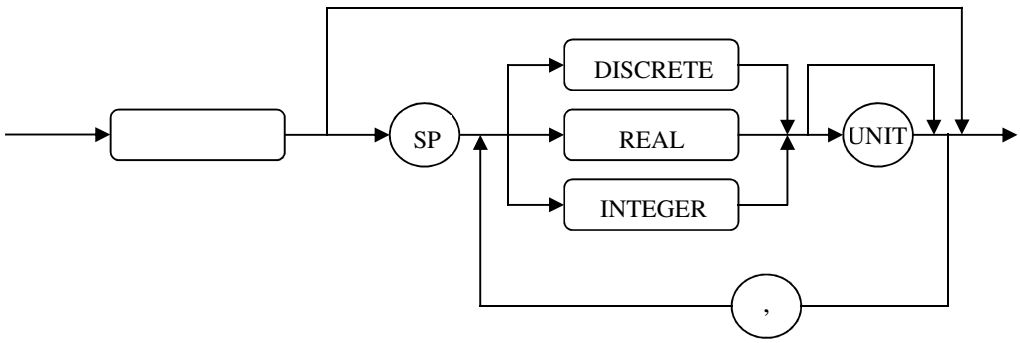

Figure 1-4 GPIB Command Structure

Examples

No parameter: `:ANALYSIS:MARKER:LEFT`

Discrete parameter: `:METER:BIAS-STAT ON`

Real parameter: `:METER:FREQ 1.2E6`

Integer parameter: `:ANALYSIS:MARKER:SELECT 1`

1.3 Data Output

Data is returned from the instrument as an ASCII character string that is terminated with a line feed character.

1.3.1 Output Syntax

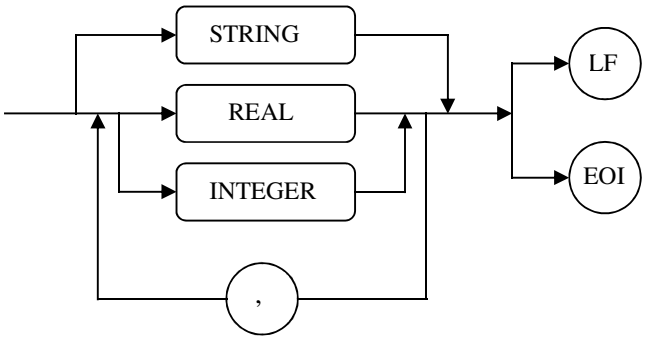

Figure 1-5 Remote Data Output

Examples

String data: `IMPEDANCE vs. FREQUENCY`

Real data: `1.344517e+005`

Integer data: `2`

Multiple data: `9.243736e+002, 4.748015e+004`

1.3.2 Real Data Errors

Real data may be output from the instrument containing a leading '#' character. This indicates that the instrument encountered a numerical error while processing the previous GPIB command. This error is usually caused by submitting a query for an instrument parameter which has not been set or a measurement not completed.

1.4 Status Groups

Bit	Name	Description
0	**OPC**	Operation Complete: Not used, commands are processed sequentially.
1	**RQC**	Not used.
2	**QYE**	Not used.
3	**DDE**	Device Dependant Error
4	**EXE**	Execution Error: Command could not be processed, ie parameter out of range.
5	**CME**	Command Error: Command not understood, ie syntax error.
6	**URQ**	Not used.
7	**PON**	1 if the instrument has been powered down since the last read, 0 otherwise.

Table 1-2 Standard Event Group

Bit	Name	Description
0	**Calibrating**	Set when calibration in progress.
1-2	**Settling**	Not used.
3	**Sweeping**	Set when sweeping.
4	**Measuring**	Set when measuring.
5-14	**-**	Not used.
15	**Always Zero**	Always Zero.

Table 1-3 Standard Operation Status Group

Bit	Name	Description
0-2		Not used.
3	**QUE**	Not used.
4	**MAV**	Message available in output queue.
5	**ESB**	Standard Event group summary bit.
6	**RQS**	Service Request.
7	**OPR**	Standard Operation group summary bit.

Table 1-4 Status Group

Group summary bits are set when the value of the group register masked with the value of the enable register (logical AND) is not zero (logical OR).

RQS is set when the value of the Status Group masked with the value of the Status Group Enable register (logical AND) is not zero (logical OR).

RQS being set will generate a GPIB service request *(GPIB only)*.

1.5 List of Commands and Queries

Command	Query	Brief Description	Page
COMMON COMMANDS & QUERIES			
*ESE <int>	*ESE?	Standard Event Enable group value	21
-	*ESR?	Standard Event group value	21
-	*IDN?	Instrument identification	21
-	*OPT?	Instrument hardware options	21
*SRE <int>	*SRE?	Status Byte Enable group value (GPIB only)	22
-	*STB?	Status Byte group value	22
*TRG	-	Trigger a measurement	22
:STATUS (STATUS COMMANDS & QUERIES)			
:OPER:ENAB <int>	-	Standard Operation Status group enable register	23
-	:OPER:EVEN?	Standard Operation Group event register	23
-	:OPER:COND?	Standard Operation Group register	23

CALIBRATION COMMANDS & QUERIES			
:FREQ-LIMIT	:FREQ-LIMIT?	Set Upper Frequency Limit for trims and HF Comp	25
:OC-TRIM	:OC-TRIM?	Perform an Open Circuit Trim	24
:SC-TRIM	:SC-TRIM?	Perform a Short Circuit Trim	24
:HF-COMP	:HF-COMP?	Start the HF Compensation	25
:STORE-TRIMS	-	Store user short circuit and open circuit trim values	25
:CLEAR-TRIMS	-	Clear user short circuit and open circuit trim values	25
:STORE-HF-COMP	-	Store user HF Compensation values	25
:CLEAR-HF-COMP	-	Clear user HF Compensation values	26

METER MODE COMMANDS & QUERIES (:METER)			
:TRIG	-	Trigger a measurement	27
:FUNC:1	:FUNC:1?	Term 1 measurement parameter	27
:FUNC:2	:FUNC:2?	Term 2 measurement parameter	27
:EQU-CCT	:EQU-CCT?	Equivalent circuit setting	28
:SPEED	:SPEED?	Speed setting	28
:FREQ	:FREQ?	Frequency setting	29
:LEV	:LEV?	AC Drive level	29
-	:DRIVE?	AC Drive type	30
:RANGE	:RANGE?	Range	30
:BIAS	:BIAS?	Set the DC Bias Source Level	30
:BIAS-STAT	:BIAS-STAT?	Change the state of the DC Bias Source	31
:BIAS-TYPE	:BIAS-TYPE?	Select the DC Bias Source.	31
:DISP	:DISP?	Display Absolute / Deviation	31
:DEV-TERM	:DEV-TERM?	Term 1 / 2 used for deviation display	33
:DEV-TYPE	:DEV-TYPE?	Absolute / % / ppm deviation format	33
:NOM	:NOM?	Nominal value in deviation mode	34
:SAVE-NOM	-	Used last measurement as nominal value	34
:SHOW-SCALE1	:SHOW-SCALE1?	Term 1 scale bar on / off	34
:SHOW-SCALE2	:SHOW-SCALE2?	Term 2 scale bar on / off	34
:SCALE1-HI	SCALE1-HI?	Term 1 scale bar high limit	34
:SCALE2-HI	:SCALE2-HI?	Term 2 scale bar high limit	34
:SCALE1-LO	SCALE1-LO?	Term 1 scale bar low limit	35
:SCALE2-LO	:SCALE2-LO?	Term 2 scale bar low limit	35
:SCALE1-NOM	SCALE1-NOM?	Term 1 scale bar nominal value	35
:SCALE2-NOM	:SCALE2-NOM?	Term 2 scale bar nominal value	35
:SCALE1-SAVENOM	-	Use last measurement as Term 1 scale bar nominal value	36
:SCALE2-SAVENOM	-	Use last measurement as Term 2 scale bar nominal value	36
:SCALE1-TYPE	:SCALE1-TYPE?	Term 1 scale bar as Absolute / Relative	36
:SCALE2-TYPE	:SCALE2-TYPE?	Term 2 scale bar as Absolute / Relative	36
:Q-SAVE	-	Save the current Meter Mode Measurement Setup	36
:Q-LOAD	-	Load the previously saved Meter Mode Measurement Setup	37
:RESO:ST	:RESO:ST?	Set the Start Frequency for the search	37

:RESO:SP	:RESO:SP?	Set the Stop Frequency of the search	37
:RESO:EQU-CCT	:RESO:EQU-CCT?	Select the Equivalent Circuit Type	37
:RESO:TRIG	-	Begin a Resonance Search	38
:RESO:TRAIN	-	Execute the 'Check Valid' function	38
-	:RESO:FM-FN?	Query the frequencies at Zmin and Zmax (fm and fn).	39
-	:RESO:FS-FP?	Query the frequencies at Gmax and Rmax (fs and fp)	39
-	:RESO:CP-1K?	Query the Cp reading at 1kHz	39
-	:RESO:KEFF?	Query the Keff result	40
:RESO:ENABLE-CP:	RESO:ENABLE-CP?	Enable/Disable the Cp at 1kHz calculation	40
:RESO:DEPTH	:RESO:DEPTH?	Set Resonance Search Depth	40
:RESO:SPEED	:RESO:SPEED?	Set the Measurement Speed	41
:RESO:LO-LIM	:RESO:LO-LIM?	Set the Low Limit Frequency	41
:RESO:HI-LIM	:RESO:HI-LIM?	Set the High Limit Frequency	42
:RESO:ENABLE-HILO	:RESO:ENABLE-HILO?	Enable/Disable the Hi/Lo Test Limits	42
:FAST-GPIB	-	Enable / disable display update	36
:ANA (ANALYSIS MODE COMMANDS & QUERIES)			
:EXPORT-OVERWRITE	:EXPORT-OVERWRITE	File Overwrites setting in Export Trace	43
:EXPORT \xxxx\yyyy.csv	-	Write 'export data' file to USB	43
:BITMAP-OVERWRITE	:BITMAP-OVERWRITE?	File Overwrites setting in Save Bitmap	44
:BITMAP \xxxx\yyyy.bmp	-	Write 'save bitmap' file to USB	44
:Q-SAVE	-	Save the current Analysis Mode Measurement Setup	45
:Q-LOAD	-	Load the previously saved Analysis Mode Measurement Setup	45
:TRIG	-	Start a sweep	45
:PROP1	:PROP1?	Trace 1 measurement parameter	45
:PROP2	:PROP2?	Trace 2 measurement parameter	45
:EQU-CCT	:EQU-CCT?	Equivalent Circuit setting	46
:SPEED	:SPEED?	Speed setting	46

:RANGE	:RANGE?	Range	47
:LEV	:LEV?	AC Drive level for frequency and DC Bias sweeps	47
-	:DRIVE?	AC Drive type for frequency and DC Bias sweeps	48
:FREQ	:FREQ?	Frequency setting for AC Drive and DC Bias sweeps	48
:BIAS	:BIAS?	Set the DC Bias Source Level	49
:BIAS-STAT	:BIAS-STAT?	Change the state of the DC Bias Source	49
:BIAS-TYPE	:BIAS-TYPE?	Select the DC Bias Source.	50
:POINTS	:POINTS?	Number of measurement points in a trace	50
:LOG-X	:LOG-X?	X-axis as log/linear scale	51
:START	:START?	X-axis start value	51
:STOP	:STOP?	X-axis stop value	52
:LOG-Y	:LOG-Y?	Y-axis as log/linear scale	52
:MAX1	:MAX1?	Trace 1 Y-axis maximum value	52
:MAX2	:MAX2?	Trace 2 Y-axis maximum value	52
:MIN1	:MIN1?	Trace 1 Y-axis minimum value	53
:MIN2	:MIN2?	Trace 2 Y-axis minimum value	53
:TITLE	:TITLE?	Graph title	53
:AVE	:AVE?	Trace averages	53
:RESET-AVE	-	Reset trace averaged values to zero	54
:FIT	-	Auto Fit Y-axes	54
-	:POINT?	Query X-value and Trace 1 / 2 Y-values at the n^{th} point on the traces	54
-	:RESULT?	Query the measurement result nearest to the defined X-axis value	54
:MKR:STATE	:MKR:STATE?	Enable / disable the Active Marker	55
:MKR:TYPE	:MKR:TYPE?	Select the Active Marker Display type	55
:MKR:SELECT	:MKR:SELECT?	Select the Active Marker Number	56
:MKR:POSITION	:MKR:POSITION?	Move the Active Marker to the point nearest the X-value	56
:MKR:LEFT	-	Move the Active Marker left to the next measurement on the traces	56
:MKR:RIGHT	-	Move the Active Marker right to the next measurement on the traces	56

Delta Marker Functions			
:MKR:DELTA-PARAMETER	:MKR:DELTA-PARAMETER?	Set the X-value to which the delta marker will be relative	57
:MKR:DELTA-VALUE1	:MKR:DELTA-VALUE1?	Set the Trace 1 value to which the delta marker will be relative	57
:MKR:DELTA-VALUE2	:MKR:DELTA-VALUE2?	Set the Trace 2 value to which the delta marker will be relative	57
:MKR:DELTA-USE-MARKER	-	Set the Current Marker Value as the nominal	57
:MKR:RELATIVE-MARKER	:MKR:RELATIVE-MARKER?	Set the marker to use for the relative marker calculations.	58
-	:MKR:RESULT?	Returns the result of the Delta Marker	58
Peak Search Functions			
:MKR:SEARCH-TYPE	:MKR:SEARCH-TYPE?	Select Search Type as Peak or Dip	58
:MKR:SEARCH-TRACE	:MKR:SEARCH-TRACE?	Select the Trace to use for peak/dip searching	59
:MKR:SEARCH-FIND	-	Move the Active Marker to the peak / dip	59
:MKR:SEARCH-LEFT	-	Move the Active Marker to the next peak / dip to the left	59
:MKR:SEARCH-RIGHT	-	Move the Active Marker to the next peak / dip to the right	60
:MKR:SEARCH-NEXT-HIGH	-	Move the Active Marker to the next highest peak / dip	60
:MKR:SEARCH-NEXT-LOW	-	Move the Active Marker to the next lowest peak / dip	60

1.6 /E Equivalent Circuit Analysis Option

DISPLAY	-	Show/Hide Equivalent Circuit mode dialog box	61
CCT	CCT?	Set the Equivalent Circuit type	61
R1	R1?	Set the R1 Equivalent Circuit component value	61
C1	C1?	Set the C1 Equivalent Circuit component value	62
L1	L1?	Set the L1 Equivalent Circuit component value	62
C0	C0?	Set the C0 Equivalent Circuit component value	63

TRACE	TRACE?	Turn Equivalent Circuit traces on and off	64
CALC-PARS	-	Calculate Equivalent Circuit Parameters	64
MODE	MODE?	Select Equivalent Circuit Mode	64
-	POINT?	Query a point on the Equivalent Circuit trace	65
-	RESULT?	Query the Equivalent Circuit result nearest to the defined X-axis value	65

1.7 /K Materials Test Option

Materials Function – (MATerials:)

TYPE	TYPE?	Select the Relative Permittivity test type	66
D	D?	Set the Guard Electrode diameter ‘d’ in mm	66
CONTact-TM	CONTact-TM?	Set the Material Thickness ‘tm’ in mm (Contact Method)	66
TG	TG?	Set the Electrode Separation ‘tg’ in mm (Non-Contact Method)	67
NONCONTact-TM	NONCONTact-TM?	Set the Material Thickness ‘tm’ in mm (Non-Contact Method)	67
MEASure-CG	MEASure-CG?	Measure the Capacitance Without MUT ‘Cg’	67
N	N?	Set the Number of Turns ‘N	68
L	L?	Set the Average Path Length ‘l’ in mm	68
A	A?	Set the Cross Sectional Area of toroid ‘A’ in mm^2	68
MEASure-LR	MEASure-LR?	Measure L_W/R_W reference data.	69
PROPerty1	PROPerty1?	Select the Measurement Property for Trace 1 / 2	69
PROPerty2	PROPerty2?	Select the Measurement Property for Trace 1 / 2	69
FUNCtion:1	FUNC:1?	Select Function (Term) 1 / 2 Measurement Parameter	70
FUNCtion:2	FUNC:2?	Select Function (Term) 1 / 2 Measurement Parameter	70

1.8 /Y Polar Complex Plots

DISPLAY-MODE	DISPLAY-MODE?	Select the Display Mode	72
POLAR PLOT			
POLAR-PROPerty	POLAR-PROPerty?	Select the measurement Parameter for the polar plot.	72
POLAR-SCALE	POLAR-SCALE?	Set the Polar Plot Scale	73

POLAR-DIVisionFullScale	POLAR-DIVisionFullScale?	Set the number of divisions for full scale on the polar plot	73
POLA-FRaMe	POLAR-FRaMe?	Enable/disable the Cursor Frame on the polar plot.	73
POLAR-FIT <integer>		Autofit the Polar Plot	74
LOG-SWeePPARameter <disc>	LOG-SWeePPARameter?	Select Logarithmic or Linear Sweep	74
COMPLEX-PROPerty <disc>	COMPLEX-PROPerty?	Select Measurement Parameters for the complex plot	74
COMPLEX-FrameWidth <real>	COMPLEX-FrameWidth?	Set the Frame Width (and height) of the complex plot	75
COMPLEX-FrameCentreX <real>	COMPLEX-FrameCentreX?	Set the X-axis Frame Centre of the complex plot	75
COMPLEX-FrameCentreY <real>	COMPLEX-FrameCentreY?	Set the Y-axis Frame Centre of the complex plot	76
COMPLEX-FIT		Fit the complex plot to the display area	76

1.9 Common Commands

*ESE <integer>

Set the value of the Standard Event Enable group

Parameter: The Standard Event Enable group value as an integer

Response: None

Note: See **Status Groups** section

*ESE?

Query the Standard Event Enable Group Mask

Parameter: None

Response: The value of the Standard Event Enable Group Mask as an integer

*ESR?

Query the Standard Event Group Value

Parameter: None

Response: The Standard Event Group Value as an integer

*IDN?

Query the instrument identification

Parameter: None

Response: The instrument identification string in the form:

Manufacturer, Model, 0, Software Revision

Example

```
WAYNE KERR, 65120B, 3.382
```

*OPT?

Query the hardware options fitted in the instrument.

Parameter: None

Response: A comma separated list of options:

`0`	No hardware options fitted
`D1`	/D1 DC Bias option fitted
`D2`	/D2 DC Bias option fitted

Common Commands

*SRE <integer> (GPIB only)

Set the value of the Status Byte Enable group. (See **Status Groups** section).

Parameter: The Status Byte Enable Group Value as an integer.

Response: None

*SRE? (GPIB only)

Query the Status Byte Enable group

Parameter: None

Response: The value of the Status Byte Enable group as an integer.

*STB?

Query the Status Byte Group

Parameter: None

Response: The value of the Status Byte group as an integer

Note: This group can also be read by a GPIB serial poll *(GPIB only)*

*TRG

Trigger a measurement

Parameter: None

Response: Mode dependant

Note: See `:TRIG` command in Meter Mode and Analysis Mode

1.10 Status Commands

OPERation:ENABle <integer>

Set the value of the Standard Operation Status Group Enable Register

Parameter: None

The value of the register as an integer

Response: None

OPERation:EVENt?

Query the Standard Operation Group Event Register

Parameter: None

Response: The value of the register as an integer

Note: The Standard Operation Group Event Register latches transitions of the condition register.

OPERation:CONDition?

Query the value of the Standard Operation Group register

Parameter: None

Response: The value of the register as an integer

1.11 Calibration

:OpenCircuit-TRIM

Perform an Open Circuit Trim

Parameter: None

Response: The Open Circuit Trim result

`1` Trim passed

`0` Trim failed

:OpenCircuit-TRIM?

Query the Open Circuit Trim status

Parameter: None

Response: The Open Circuit Trim status

`1` Trim valid

`0` Trim invalid

:ShortCircuit-TRIM

Perform a Short Circuit Trim

Parameter: None

Response: The Short Circuit Trim result

`1` Trim passed

`0` Trim failed

:ShortCircuit-TRIM?

Query the Short Circuit Trim status

Parameter: None

Response: The Short Circuit Trim status

`1` Trim valid

`0` Trim invalid

Common Commands

:HF-COMPensation

Start the HF Compensation routine

Parameter: None

Response: None

Note: The *STATUS? command should be used to determine what stage of the HF Compensation routine has been reached and when to fit the relevant transfer standard component.

:FREQuency-LIMIT <real>

Set the Upper Frequency Limit for Trims and HF Compensation

Parameter: Set the value of Upper Frequency Limit as a real number

Response: None.

Example: Set 1MHz limit

```
:CAL:FREQ-LIMIT 1E6
```

Note: This command is only required when an Upper Frequency Limit less than the instrument's maximum frequency is required.

:FREQuency-LIMIT?

Query the Upper Frequency Limit for Trims and HF Compensation

Parameter: None

Response: The value of Upper Frequency Limit as a real number

Example: When limit is set to 1MHz

```
1.000000e+006
```

:STORE-TRIMS

Store User Short Circuit and Open Circuit Trim values

Parameter: None

Response: None

:CLEAR-TRIMS

Clear User Short Circuit and Open Circuit Trim values

Parameter: None

Response: None

:STORE-HF-COMPensation

Store User HF Compensation values

Parameter: None

Common Commands

Response: None

:CLEAR-HF-COMPensation

Clear User HF Compensation values

Parameter: None

Response: None

1.12 Meter Mode

:TRIGger

Trigger a measurement

Parameter: None

Response: The measurement results as comma delimited real numbers.

Example: Response for measurements of Function 1 (set to C) = 47.1404nF and Function 2 (set to D) = 0.00133

```
4.714043e-008,1.337683e-003
```

:FUNCtion:1 <discrete> :FUNCtion:2 <discrete>

Select the Function (Term) 1 / 2 Measurement Parameter

Parameter				
	`L`	Inductance	`C`	Capacitance
	`R`	Resistance	`Z`	Impedance
	`Y`	Admittance	`X`	Reactance
	`G`	Conductance	`B`	Susceptance
	`Q`	Quality Factor	`D`	Dissipation Factor
	`Angle`	Phase Angle		

Response: None.

Example: Set Term 1 to Phase Angle

```
:METER:FUNC:1 ANGLE
```

Note: 6 extra Parameter are available when the /K Materials Test option is installed.

:FUNCtion:1? :FUNCtion:2?

Query the Function (Term) 1 / 2 Measurement Parameter

Parameter: None

Response:				
	`0`	Inductance	`1`	Capacitance
	`2`	Resistance	`3`	Impedance
	`4`	Admittance	`5`	Reactance
	`6`	Conductance	`7`	Susceptance
	`8`	Quality Factor	`9`	Dissipation Factor
	`10`	Phase Angle		

Note: 6 extra Parameter are available when the /K Materials Test option is installed.

Common Commands

:EQU-CCT <discrete>

Select the Equivalent Circuit type

Parameter:

SER	Series
PAR	Parallel

Response: None

Example: Set the Equivalent Circuit to Series

```
:METER:EQU-CCT SER
```

:EQU-CCT?

Query the Equivalent Circuit type

Parameter: None

Response:

0	Series
1	Parallel

:SPEED <discrete>

Select the Measurement Speed

Parameter:

MAXimum	Maximum speed
FAST	Fast speed
MEDium	Medium speed
SLOW	Slow speed
<integer>	Custom speed

Response: None

Example 1: Set Speed to Maximum

```
:METER:SPEED MAX
```

Example 2: Set Speed to Custom Speed 128:

```
:METER:SPEED 128
```

:SPEED?

Query the Measurement Speed

Parameter: None.

Response

-4	Maximum speed
-3	Fast speed
-2	Medium speed
-1	Slow speed
1-256	Custom speed

Common Commands

:FREQuency <real>

Set the AC Drive Frequency

Parameter: The Frequency as a real number

Response: None

Example: Set 1MHz AC Drive Frequency

```
:METER:FREQ 1M
```

:FREQuency?

Query the AC Drive Frequency

Parameter: None

Response: The Frequency as a real number

Example: For 1MHz AC Drive Frequency

```
1.000000e+006
```

:LEVel <discrete>

Set the AC Drive Level

Parameter: The AC Drive Level as real number, followed by the Drive type suffix if required (i.e. when changing from V to I or I to V):

`V` Voltage Drive

`A` Current Drive

Response: None

Example 1: Set 1V AC Voltage Drive if existing Drive is Current

```
:METER:LEVEL 1V
```

Example 2: Set 10mA AC Current Drive if existing Drive is Voltage

```
:METER:LEVEL 0.01A
```

:LEVel?

Query the AC Drive Level

Parameter: None

Response: The value of the AC Drive Level

Example 1: For 1V AC Voltage Drive:

```
1.000000e+000
```

Example 2: For 10mA AC Current Drive

```
1.000000e-002
```

Note: Use `DRIVE?` to query if the AC Drive type is set to voltage or current

Common Commands

:DRIVE?

Query the AC Drive type

Parameter: None

Response

0	Voltage Drive
1	Current Drive

Note: The LEVEL command is used to set the value of the AC Drive Level.

:RANGE <discrete>

Select the Measurement Hardware Range

Parameter:

AUTO	Auto-range	1	Range 1
2	Range 2	3	Range 3
4	Range 4	5	Range 5
6	Range 6	7	Range 7

Response: None

Example: Set Measurement Hardware Range 3

```
:METER:RANGE 3
```

:RANGE?

Query the Measurement Hardware Range

Parameter: None

Response:

0	Auto-range	1	Range 1
2	Range 2	3	Range 3
4	Range 4	5	Range 5
6	Range 6	7	Range 7

Note: Auto-range always returns 0 regardless of the range actually used for the measurement.

:BIAS <real>

Set the DC Bias Source Level

Parameter: The DC Bias Source Level as a real number

Response: None

Example: Set 1V DC Bias Source Level to 1V

```
:METER:BIAS 1.0
```

Note: Command :METER:BIAS-TYPE VOL is used to select Voltage bias.

:BIAS?

Query the DC Bias Source Level

Parameter: None

Response: The DC Bias Source Level as a real number

Example: When DC Bias Source Level is set to 1V

```
1.0
```

:BIAS-STATe <disc>

Change the state of the DC Bias Source

Parameter:

`ON`	Turn Bias On
`OFF`	Turn Bias Off

Response: None

Example: Turn DC Bias Source on

```
:METER:BIAS-STAT ON
```

:BIAS-STATe?

Query the state of the DC Bias Source

Parameter: None

Response:

`0`	Bias Off
`1`	Bias On

:BIAS-TYPE <disc>

Select the DC Bias Source.

Parameter:

`VOLtage`	Voltage bias
`CURrent`	Current bias

Response: None

Example: Select voltage bias

```
:METER:BIAS-TYPE VOL
```

:BIAS-TYPE?

Query the selected bias source

Parameter: None.

Response:

`0`	Current bias
`1`	Voltage bias

:DISPlay <discrete>

Select the Meter Mode Display Format

Common Commands

Parameter	`ABSolute`	Absolute Display
	`DEViation`	Deviation Display

Response: None

Example: Set Deviation Display

```
:METER:DISP DEV
```

Common Commands

:DISPlay?

Query the Meter Mode Display Format

Parameter: None

Response: 0 Absolute Display

1 Deviation Display

:DEViation-TERM <integer>

Select Term 1 or Term 2 to use for Deviation Display

Parameter: 1 Term 1

2 Term 2

Response: None

Example: Set Term 1

```
:METER:DEV-TERM 1
```

:DEViation-TERM?

Query the Measurement Term which is used for Deviation Display

Parameter: None

Response: 1 Term 1

2 Term 2

:DEViation-TYPE <discrete>

Select the Deviation Display Format

Parameter: ABSolute Absolute Deviation

PERCentage Percentage Deviation

PPM Parts-per-million Deviation

Response: None

Example: Set Percentage Deviation

```
:METER:DEV-TYPE PERC
```

:DEViation-TYPE?

Query the Deviation Display Format

Parameter: None

Response: 0 Absolute Deviation

1 Percentage Deviation

2 Parts-per-million Deviation

Common Commands

:NOMinal <real>

Set the Nominal Value used in deviation mode

Parameter: The Nominal Value as a real number.

Response: None

Example: Set 10uH Nominal Value (Term set to L):

```
:METER:NOM 10u
```

:NOMinal?

Query the Nominal Value used in Deviation Mode

Parameter: None

Response: The Nominal Value as a real number

Example: For 10uH nominal value (Term set to L)

```
1.000000e-005
```

:SAVE-NOMinal

Set the Nominal Value used in deviation mode to the last measured value

Parameter: None

Response: None

:SHOW-SCALE1 <discrete> :SHOW-SCALE2 <discrete>

Select the Term 1 / Term 2 Scale Bar on/off

Parameter `OFF` Scale Bar Off

`ON` Scale Bar On

Response: None

Example: Set Term 1 Scale Bar On:

```
:METER:SHOW-SCALE1 ON
```

:SHOW-SCALE1? :SHOW-SCALE2?

Query the Term 1 / Term 2 Scale Bar on/off

Parameter: None

Response: The Term 1 / 2 Scale Bar state

`0` Scale Bar Off

`1` Scale Bar On

:SCALE1-HIgh <real> :SCALE2-HIgh <real>

Set the Term 1 / Term 2 Scale Bar High Limit

Common Commands

Parameter: The High Limit as a real number

Response: None

Example: Set Term 1 Scale Bar High Limit to 110 (in Absolute Mode):

```
:METER:SCALE1-HI 110
```

:SCALE1-HIgh? :SCALE2-HIgh?

Query the Term 1 / Term 2 Scale Bar High Limit

Parameter: None

Response: The High Limit as a real number

Example: For Term 1 Scale Bar High Limit set to 110 (in Absolute Mode):

```
1.100000e+002
```

:SCALE1-LOw <real> :SCALE2-LOw <real>

Set the Term 1 / Term 2 Scale Bar Low Limit

Parameter: The Low Limit as a real number

Response: None

Example: Set Term 1 Scale Bar Low Limit to -10% (in Relative Mode):

```
:METER:SCALE1-LO -10
```

:SCALE1-LOw? :SCALE2-LOw?

Query the Term 1 / Term 2 Scale Bar Low Limit

Parameter: None

Response: The Low Limit as a real number

Example: For Term 1 Scale Bar Low Limit set to -10% (in Relative Mode):

```
-1.000000e+001
```

:SCALE1-NOMinal <real> :SCALE2-NOMinal <real>

Set the Term 1 / Term 2 Scale Bar Nominal Value

Parameter: The Nominal Value as a real number

Response: None

Example: Set Term 1 Scale Bar Nominal Value to 100:

```
:METER:SCALE1-NOM 100
```

:SCALE1-NOMinal? :SCALE2-NOMinal?

Query the Term 1 / Term 2 Scale Bar Nominal Value

Parameter: None

Response: The Nominal Value as a real number

Example: For Term 1 Scale Bar Nominal Value set to 100:

```
1.000000e+002
```

:SCALE1-SAVENOMinal :SCALE2-SAVENOMinal

Set the Term 1 / Term 2 Scale Bar Nominal Value to the most recent measurement

Parameter: None

Response: None

:SCALE1-TYPE <discrete> :SCALE2-TYPE <discrete>

Select the Term 1 / Term 2 Scale Bar Display Type

Parameter		
	`RELative`	Relative(%)
	`ABSolute`	Absolute

Response: None

Example: Set Term 1 Scale Bar Display Type to Relative:

```
:METER:SCALE1-TYPE REL
```

:SCALE1-TYPE? :SCALE2-TYPE?

Query the Term 1 / Term 2 Scale Bar Display Type

Parameter: None

Response:		
	`0`	Relative
	`1`	Absolute

:FAST-GPIB <discrete>

Enable / Disable display update for every measurement

Parameter:		
	`ON`	Disable display updates (Fast Mode)
	`OFF`	Enable display updates (Standard Mode)

Response: None

Example: Set Fast Mode:

```
:METER:FAST-GPIB ON
```

Note: Fast Mode is not available with front panel (local) control.

:Q-SAVE

Save the current Meter Mode Measurement Setup as the QuickSave file

Parameter: None

Response: None

Common Commands

:Q-LOAD

Load the Meter Mode Measurement Setup previously saved as the QuickSave file

Parameter: None

Response: `0` File not found

`1` File found

:RESOnance:StarT <real>

Set the Start Frequency for the search

Parameter: Start Frequency in Hertz

Response: None

Example: Set the Start Frequency to 1kHz

```
:METER:RESO:ST 1k
```

:RESOnance:StarT?

Query the Start Frequency of the search

Parameter: None

Response: Start Frequency in engineering format

Example: Set Start Frequency set to 1kHz

```
+.10000000E+04
```

:RESOnance:StoP <real>

Set the Stop Frequency of the search

Parameter: Stop Frequency in Hertz

Response: None

Example: Set the Stop Frequency to 10kHz

```
:METER:RESO:SP 10k
```

:RESOnance:StoP?

Query the Stop Frequency of the search

Parameter: None

Response: Stop Frequency in engineering format

Example: Stop Frequency set to 1kHz: `+.10000000E+05`

:RESOnance:EQU-CCT <disc>

Select the Equivalent Circuit Type

Common Commands

Parameter: `SER` Series Resonance

`PAR` Parallel Resonance

`XTAL` Dual Resonance Device

Response: None

Example: To select Series Resonance Search:

```
:METER:RESO:EQU-CCT SER
```

:RESOnance:EQU-CCT?

Query the Equivalent Circuit Type

Parameter: None

Response: `0` Series Resonance

`1` Parallel Resonance

`2` Dual Resonance Device

:RESOnance:TRIG

Begin a Resonance Search.

Parameter: None

Response: Returns 7 values and 1 Pass/Fail Result (all separated by commas)

The values depend on the Equivalent Circuit set using the `:RESO:EQU-CCT` command:

Equivalent Circuit	Value #1	Value #2	Value #3	Value #4	Value #5	Value #6	Value #7	PASS /FAIL
Series	Fo	0	0	C	L	R	Q	
Parallel	Fo	0	0	C	L	R	Q	
XTAL	Fr	Fa	C0	C1	L	R	Q	

Example (Crystal/Piezo Mode): `:METER:RESO:TRIG`

returns

```
+.77534195E+06, +.77535195E+06, +.47321000E-05, +.47321000E-12,
+.89043000E-08,   +.19562000E-02, +.221748E+02, -1
```

indicating resonant frequencies of fr = 775.342kHz and fa = 775.352kHz with equivalent circuit values of C0 = 4.7321µF, C1 = 4.7321pF, L = 8.904nH, R = 1.956mΩ , a Q value of 22.175 and Pass/Fail disabled

775.342 kHz	775.352 kHz	4.7321 µF	4.7321 pF	8.904 nH	1.956 mΩ	22.175	disabled
Fr	Fa	C0	C1	L	R	Q	

:RESOnance:TRAINing

Common Commands

Execute the 'Check Valid' function.

Parameter: None

Response:

0	Unknown state
1	Search range valid
2	No resonances found. Decrease Start frequency and/or increase Stop frequency. Start and Stop frequencies are either both above or both below the 2 resonance frequencies.
3	Parallel resonance not found. Increase Stop frequency
4	No resonances found. Decrease Start frequency and increase Stop frequency. Start and Stop frequencies are between the 2 resonance frequencies.
5	Series resonance not found. Decrease Start frequency.

:RESOnance:FM-FN?

Query the frequencies at Zmin and Zmax (fm and fn).

Parameter: None

Response: fm and fn values separated by a comma

Example: For fm = 775.342kHz and fn = 775.352kHz

```
+.77534195E+06, +.77535195E+06
```

:RESOnance:FS-FP?

Query the frequencies at Gmax and Rmax (fs and fp)

Parameter: None

Response: fs and fp values separated by a comma

Example: For fs = 775.342kHz and fp = 775.352kHz

```
+.77534195E+06, +.77535195E+06
```

:RESOnance:CP-1K?

Query the Cp reading at 1kHz (enabled/disabled using the `:RESO:ENABLE-CP` function)

Parameter: None

Response: The Cp reading at 1kHz in engineering format

Example1: For C0 = 1pF

```
+.10000000E-11
```

Example2: if the function is not enabled.

```
+0.0000000E+000
```

Common Commands

:RESOnance:KEFF?

Query the Keff result

Parameter: None

Response: Keff in engineering format

Example: Keff = 0.0001

```
+.10000000E-3
```

:RESOnance:ENABLE-CP <int>

Enable/Disable the Cp at 1kHz calculation

Parameter: `0` Disable

`1` Enable

Response: None

Example: Enable the Cp at 1kHz calculation:

```
:METER:RESO:ENABLE-CP 1
```

:RESOnance:ENABLE-CP?

Query the status of the 'ENABLE-CP' function

Parameter: None

Response: `0` Disable

`1` Enable

:RESOnance:DEPTH <integer>

Set Resonance Search Depth

Parameter: `0` to `16`

Response: None

Example: Set the Resonance Search Depth to 2 iterations

```
:METER:RESO:DEPTH 2
```

Note: This command can only be used when the Equivalent Circuit Type has been set to `SER` (Series) or `PAR` (Parallel) i.e. not `XTAL`, using the `RESO:EQU-CCT` command.

:RESOnance:DEPTH?

Query the Resonance Search Depth

Parameter: None

Response: The Resonance Search Depth as an integer

Example: `0`

Common Commands

Indicates that resonance is calculated using the entered frequency limits. No resonance search is carried out prior to calculation.

:RESOnance:SPEED <disc>

Set the Measurement Speed for the measurements used to calculate resonance

Parameter:

MAX	Maximum speed
FAST	Fast speed
MED	Medium speed
SLOW	Slow speed
<INTEGER>	Custom speed

Response: None

Example: To set the Measurement Speed to Slow

```
:METER:RESO:SPEED SLOW
```

:RESOnance:SPEED?

Query the Measurement Speed for the measurements used to calculate resonance

Parameter: None

Response: The Measurement Speed as an integer

-4	Maximum
-3	Fast
-2	Medium
-1	Slow
1-256	Custom

:RESOnance: LO-LIM <real>

Set the Low Limit Frequency

Parameter: The Low Limit Frequency in Hz

Response: None

Example: Set the Low Limit Frequency to 1kHz:

```
:METER:RESO:LO-LIM 1k
```

:RESOnance: LO-LIM?

Query the Low Limit Frequency

Parameter: None

Response: Low Limit Frequency in engineering format

Example: For a low limit frequency of 1kHz

Common Commands

```
+.10000000E+04
```

:RESOnance: HI-LIM <real>

Set the High Limit Frequency

Parameter: The required frequency in Hz

Response: None

Example: Set High Limit Frequency to 2kHz

```
:METER:RESO:HI-LIM 2k
```

:RESOnance: : HI-LIM?

Query the High Limit Frequency

Parameter: None

Response: Returns the high limit frequency in engineering format.

Example: For a High Limit Frequency of 2kHz

```
+.20000000E+04
```

:RESOnance:ENABLE-HILO

Enable/Disable the Hi/Lo Test Limits

Parameter: `0` Disable

`1` Enable

Response: None

Example: To enable the Hi/Lo test limits:

```
:METER:RESO:ENABLE-HILO 1
```

:RESOnance:ENABLE-HILO?

Query the status of the Hi/Lo Test Limits

Parameter: None

Response: `0` Disabled

`1` Enabled

1.13 Analysis Mode (:ANAlysis)

:ANA:EXPORT-OVERWRITE <discrete>

Enable/Disable 'file overwrites' in Export Trace

Parameter `ON` Allow 'EXPORT TRACE' files to be overwritten if they exist

`OFF` Disable file overwrites

Response: None

Example: Enable file overwrites:

```
:ANA:EXPORT-OVERWRITE ON
```

:ANA:EXPORT-OVERWRITE?

Query 'file overwrites' setting in Export Trace

Parameter: None

Response: `1` Overwrites disabled

`0` Overwrites enabled

:ANA:EXPORT \xxxx\yyyy.csv

Write 'Export data' file to USB at path location '\xxxx' with the filename 'yyyy.csv'

Parameter (case insensitive) `xxxx` Path name

`yyyy.csv` Filename

Response: `0` File written successfully (no pre-existing file of that name).

`1` File overwritten successfully (file of that name already existed).

`2` File not written (filename already existed but overwrite not enabled).

`3` No file extension or incorrect file extension.

`4` File not written. Incorrect path specification.

`5` File not written. No USB memory fitted.

`6` File not written. Disk full.

`7` File not overwritten. Disk full.

Example: Write data to file \DATA\RESULTS.CSV and then check the status

```
:ANA:EXPORT \DATA\RESULTS.CSV
0
```

Note 1: The path must already exist on the USB. It cannot be created by this method.

Note 2: If two USB memories are fitted, the file will be written to USB2. USB1 and USB2 do not relate to the physical ports on the rear panel of the instrument, but relate to the time at which each device was recognised by

Common Commands

the system. To ensure a particular device is USB1 remove all devices and wait 15 seconds before plugging a device in again. Then wait 15 seconds before plugging in the second device.

If the two USB memories are plugged in at power up, there is no guarantee which one will be USB1 and which one will be USB2. So it is recommended that this feature only be used with one USB device.

Note 3: Writing the file may take 3-4 seconds. Time should be allowed between writing the file and reading back the status.

:ANA:BITMAP-OVERWRITE <discrete.

Enable/Disable file overwrites in Save Bitmap

Parameter	`ON`	Allow 'Save Bitmap' files to be overwritten if they exist.
	`OFF`	Disable file overwrites.
Response:	None	
Example:	Enable file overwrites:	
	`:ANA:BITMAP-OVERWRITE ON`	

:ANA:BITMAP-OVERWRITE?

Read 'file overwrites' setting in Save Bitmap

Parameter:	None	
Response:	`0`	Overwrites disabled
	`1`	Overwrites enabled

:ANA:BITMAP \xxxx\yyyy.bmp

Write 'Save Bitmap' file to USB at path location '\xxxx' with the filename 'yyyy.csv'

Parameter (case insensitive)	`xxxx`	Path name
	`yyyy.csv`	Filename

Note 1: The path must already exist on the USB. It cannot be created by this method.

Note 2: If two USB memories are fitted, the file will be written to USB2. USB1 and USB2 do not relate to the physical ports on the rear panel of the instrument, but relate to the time at which each device was recognised by the system. To ensure a particular device is USB1 remove all devices and wait 15 seconds before plugging a device in again. Then wait 15 seconds before plugging in the second device.

If the two USB memories are plugged in at power up, there is no guarantee which one will be USB1 and which one will be USB2. So it is recommended that this feature only be used with one USB devi fitted.

Note 3: Writing the file may take up to 15 seconds. Time should be allowed between writing the file and reading back the status.

Note 4: The 'GPIB Remote/LAN Remote' flag at the top right-hand corner of the screen is disabled during the execution of this function so that it does not appear on the final screenshot.

Response

0	File written successfully (no pre-existing file of that name).
1	File overwritten successfully (file of that name already existed).
2	File not written (filename already existed but overwrite not enabled).
3	No file extension or incorrect file extension.
4	File not written. Incorrect path specification.
5	File not written. No USB memory fitted.
6	File not written. Disk full.
7	File not overwritten. Disk full.

Example: Write data to file \SCREEN\DISPLAY.BMP and then check the status

```
:ANA:BITMAP \ SCREEN\DISPLAY.BMP
0
```

:Q-SAVE

Save the current Analysis Mode Measurement Setup as the QuickSave file

Parameter: None

Response: None

:Q-LOAD

Load the Analysis Mode Measurement Setup previously saved as the QuickSave file

Parameter: None

Response:

0	File not found
1	File found

:TRIGger

Start a measurement sweep

Parameter: None

Response: None

PROPerty1 <discrete> PROPerty2 <discrete>

Select the Measurement Parameter for Trace 1 / 2

Parameter:

L	Inductance	C	Capacitance
R	Resistance	Z	Impedance
Y	Admittance	X	Reactance
G	Conductance	B	Susceptance
Q	Quality Factor	D	Dissipation Factor

Common Commands

	ANGLE	Angle

Response: None

Example: Set Trace 1 to Impedance:

```
:ANA:PROP1 Z
```

PROPerty1? PROPerty2?

Query the Trace 1 / 2 Measurement Parameter

Parameter: None.

Response:

0	Inductance	1	Capacitance
2	Resistance	3	Impedance
4	Admittance	5	Reactance
6	Conductance	7	Susceptance
8	Quality Factor	9	Dissipation Factor
10	Angle		

:EQU-CCT <discrete>

Select the Equivalent Circuit type

Parameter:	SER	Series
	PAR	Parallel

Response: None

Example: Set the Equivalent Circuit to Series:

```
:ANA:EQU-CCT SER
```

:EQU-CCT?

Query the Equivalent Circuit type

Parameter:	None	
Response	0	Series
	1	Parallel

SPEED <discrete>

Select the Measurement Speed

Parameter	MAXimum	Maximum speed
	FAST	Fast speed
	MEDium	Medium speed
	SLOW	Slow speed

	<integer>	Custom speed

Response: None

Example: Set the Speed to Maximum:

```
:ANA:SPEED MAX
```

SPEED?

Query the measurement speed

Parameter: None

Response:

-4	Maximum speed
-3	Fast speed
-2	Medium speed
-1	Slow speed
1-256	Custom speed

RANGE <discrete>

Select the measurement range

Parameter:

AUTO	Auto-range.	1	Range 1
2	Range 2	3	Range 3
4	Range 4	5	Range 5
6	Range 6	7	Range 7

Response: None

Example: Set the Range to Auto:

```
:ANA:RANGE AUTO
```

RANGE?

Query the measurement range.

Parameter: None

Response:

0	Auto-range	1	Range 1
2	Range 2	3	Range 3
4	Range 4	5	Range 5
6	Range 6	7	Range 7

:LEVel <discrete>

Set the AC Drive Level for frequency and DC Bias Level sweeps

Parameter: The AC Drive Level as a real number

Response: None

Example: Set 1V AC Voltage Drive

```
:ANA:LEVEL 1V
```

Set 10mA AC Current Drive

```
:ANA:LEVEL 0.01A
```

:LEVEL?

Query the AC Drive Level

Parameter: None

Response: The AC Drive level

Example: For 1V AC Voltage Drive:

```
1.000000e+000
```

For 10mA AC Current Drive

```
1.000000e-002
```

Note: Use the **DRIVE?** query to see if AC Drive type is set to voltage or current.

When AC Drive sweeps are set, this query will respond with the last AC Drive level set for frequency or bias sweeps

:DRIVE?

Query the AC Drive type

Parameter: None

Response: The AC Drive type

`0` Voltage drive

`1` Current drive

Note: The **LEVEL** command is used to set the value of the AC Drive level

:FREQuency <real>

Set the AC Drive Frequency for AC Drive Level and DC Bias Level sweeps

Parameter: The frequency as a real number.

Response: None

Example: Set 10MHz AC Drive frequency.

```
:ANA:FREQ 10M
```

:FREQuency?

Query the AC Drive Frequency

Parameter: None

Response: The frequency as a real number

Example: For 10MHz AC Drive frequency:

```
1.000000e+007
```

Note: When frequency sweeps are set, this query will respond with the last frequency set for AC Drive or bias sweeps

DC Bias

:BIAS <real>

Set the DC Bias Source Level

Parameter: The DC Bias Source Level as a real number

Response: None

Example: Set 1V DC Bias Source Level to 1V

```
:ANA:BIAS 1.0
```

Note: Command `:ANA:BIAS-TYPE VOL` is used to select Voltage bias.

:BIAS?

Query the DC Bias Source Level

Parameter: None

Response: The DC Bias Source Level as a real number

Example: When DC Bias Source Level is set to 1V

```
1.0
```

:BIAS-STATe

Change the state of the DC Bias Source

Parameter: `ON` Turn Bias On

`OFF` Turn Bias Off

Response: None

Example: Turn DC Bias Source on

```
:ANA:BIAS-STAT ON
```

:BIAS-STATe?

Query the state of the DC Bias Source

Parameter: None

Response: `0` Bias Off

`1` Bias On

Common Commands

:BIAS-TYPE

Select the bias source.

Parameter:	`VOLtage`	Voltage bias.
	`CURrent`	Current bias.
Response:	None.	
Example:	Select voltage bias:	
	`:ANA:BIAS-TYPE VOL`	

:BIAS-TYPE?

Query the selected bias source

Parameter:	None.	
Response:	`0`	Current bias
	`1`	Voltage bias

:PARAMETER <disc>

Select the X-axis Sweep Parameter

Parameter:	`FREQuency`	Frequency Sweep
	`LEVEL`	AC Level Sweep
	`BIAS`	DC Bias Level Sweep
Response:	None	

Note: DC Bias Level Sweep is only available when /D1 or /D2 options are fitted to the 6500

:PARAMETER?

Query the X-axis Sweep Parameter

Parameter:	None	
Response:	`0`	Frequency Sweep
	`1`	AC Level Sweep
	`2`	DC Bias Level Sweep

Note: DC Bias Level Sweep is only available when /D1 or /D2 options are fitted to the 6500

:POINTS <real>

Set the number of Measurement Points in a trace

Parameter:	The number of points as an integer.
	Valid values are 50, 100, 200, 400, 800 and 1600 points.
Response:	None

Example: Set the number of measurement points to 100:

```
:ANA:POINTS 100
```

:POINTS?

Query the number of Measurement Points in a trace

Parameter: None

Response: The number of points as an integer

:LOG-X <discrete>

Select X-axis as Logarithmic or Linear scale

Parameter: `ON` Logarithmic scale

`OFF` Linear scale

Response: None

Example: Set X axis as Logarithmic scale

```
:ANA:LOG-X ON
```

:LOG-X?

Query the X-axis Log / Linear scale setting

Parameter: None

Response: `0` Linear scale

`1` Logarithmic scale

:START <real>

Set the X-axis Start Value

Parameter: The value as a real number

Response: None

Example: Set X-axis start value to 100:

```
:ANA:START 100
```

:START?

Query the X-axis Start Value

Parameter: None

Response: The value as a real number

Example: For a X-axis which starts at 100:

```
1.000000e+002
```

Common Commands

:STOP <real>

Set the X-axis parameter stop value.

Parameter: The value as a real number

Response: None

Example: Set X axis stop value to 120MHz:

```
:ANA:STOP 120M
```

:STOP?

Query the X-axis stop value

Parameter: None

Response: The value as a real number.

Example: For a X-axis which stops at 120MHz:

```
1.200000e+008
```

:LOG-Y <discrete>

Select Y-axis as Log or Linear scale

Parameter:

`ON`	Log scale
`OFF`	Linear scale

Response: None

Example: Set X axis as log:

```
:ANA:LOG-Y ON
```

:LOG-Y?

Query the Y-axis Log / Linear scale setting

Parameter: None

Response:

`0`	Linear scale
`1`	Log scale

:MAXimum1 <real> :MAXimum2 <real>

Set Trace 1 / 2 Y-axis Maximum Value

Parameter: The value as a real number.

Response: None

Example: Set Trace 1 Y-axis Maximum Value to 100

```
:ANA:MAX1 100
```

:MAXimum1? :MAXimum2?

Common Commands

Query Trace 1 / 2 Y-axis Maximum Value.

Parameter: None

Response: The value as a real number

Example: When Trace 1 Y-axis maximum value is 100

```
1.000000e+002
```

:MINimum1 <real> :MINimum2 <real>

Set Trace 1 / 2 Y-axis Minimum Value

Parameter: The value as a real number

Response: None

Example: Set Trace 1 Y-axis minimum value to 1:

```
:ANA:MIN1 1
```

:MINimum1? :MINimum2?

Query Trace 1 / 2 Y-axis Minimum Value

Parameter: None

Response: The value as a real number.

Example: When Trace 1 Y-axis Minimum Value is 1

```
1.000000e+000
```

:TITLE <discrete>

Define the Sweep (Graph) Title

Parameter: The Sweep Title as a string enclosed in single quotes

Response: None

Example: Set the Sweep Title IND VS FREQ:

```
:ANA:TITLE 'IND VS FREQ'
```

:TITLE?

Query the Sweep (Graph) Title

Parameter: None

Response: The Sweep Title as a string

Example: When the Sweep Title is IND VS FREQ

```
IND VS FREQ
```

:AVEerages <integer>

Set the Number of Trace Averages

Parameter: The number of averages as an integer.

Response: None

Example: Set the number of averages to 4:

```
:ANA:AVE 4
```

:AVEerages?

Query the number of trace averages.

Parameter: None

Response: The number of averages as an integer

:RESET-AVEraging

Reset the trace averaged values to zero (both traces set to zero)

Parameter: None

Response: None

:FIT <integer>

Auto Fit the Y axes to the measurement traces.

Parameter:

1	Auto Fit to Trace 1
2	Auto Fit to Trace 2
3	Auto Fit to Trace 1 and Trace 2

Response: None

Example: Auto Fit Y axes to both traces:

```
:ANA:FIT 3
```

POINT? <integer>

Query X-value and Trace 1 / 2 Y-values at the n^{th} point on the traces

Parameter: The n^{th} point on the trace as an integer

Response: The X-axis value of the n^{th} point, the Trace 1 Y-axis value and the Trace 2 Y-axis value in comma separated form

Example: Retrieve the measurement result of the first measurement point:

```
:ANA:POINT? 0
```

```
1.00000000e+003,9.24710841e+002, 5.68111232e-002
```

Where the frequency is 1kHz, the Trace 1 Y-axis value is 924.71 and the Trace 2 Y-axis value is 0.05681.

RESULT? <real>

Common Commands

Query the measurement result nearest to the defined X-axis value

Parameter: The defined x-value as a real number.

Response: The measurement result nearest to the defined x-value as the nearest x-value measurement, the Trace 1 y-value and the Trace 2 y-value in comma separated form.

Example: Query the measurement result nearest to the frequency parameter 10kHz.

```
:ANA:RESULT? 10k
```

```
9.43609621e+003, 9.24650318e+002, 3.98660591e-002
```

Where the frequency is 9.436kHz, the Trace 1 value is 924.65 and the Trace 2 value is 0.039866.

Analysis Mode – Marker (ANAlysis:MarKeR)

:MKR:STATE <discrete>

Enable / disable the Active Marker

Parameter: `ON` Turn marker on

`OFF` Turn marker off

Response: None

:MKR:STATE?

Query the state of the Active Marker

Parameter: None

Response: `0` Marker off

`1` Marker on

:MKR:TYPE <discrete>

Select the Active Marker Display type

Parameter: `NORmal` Normal display

`DELta` Delta marker

`RELative` Relative marker

Response: None

:MKR:TYPE?

Query the Active Marker Display type

Parameter: None

Response: `0` Normal

`1` Delta

Common Commands

2	Relative

:MKR:SELECT <integer>

Select the Active Marker Number

Parameter: An integer in the range 1 to 8

Response: None

:MKR:SELECT?

Query the Active Marker.

Parameter: None

Response: An integer in the range 1 to 8

:MKR:POSITION <real>

Move the Active Marker to the point nearest the X-value

Parameter: The X-value as a real number

Response: None

Example: Move the marker to 98MHz

```
:ANA:MKR:POSITION 98M
```

:MKR:POSITION?

Query the Active Marker X-value.

Parameter: None

Response: The X-value of the Active Marker

Example: For the nearest point to 98MHz:

```
1.041778e+008
```

:MKR:LEFT

Move the Active Marker left to the next measurement on the traces

Parameter: None

Response: None

:MKR:RIGHT

Move the Active Marker right to the next measurement on the traces

Parameter: None

Response: None

Common Commands

Delta Marker Functions

:MKR:DELTA-PARAMETER <real>

Set the X-value to which the delta marker will be relative

Parameter: The X-value as a real number

Response: None

Example: Delta marker will be relative to 1MHz:

```
:ANA:MKR:DELTA-PARAMETER 1M
```

:MKR:DELTA-PARAMETER?

Query the X-value to which the delta marker will be relative.

Parameter: None

Response: The delta parameter value as a real number

Example: Delta marker will be relative to 1MHz

```
:ANA:MKR:DELTA-PARAMETER 1M
```

:MKR:DELTA-VALUE1 <real> :MKR:DELTA-VALUE2 <real>

Set the Trace 1 / 2 value to which the delta marker will be relative

Parameter: The value as a real number

Response: None

Example: Set Trace 1 value to 100:

```
:ANA:MKR:DELTA-VALUE 100
```

:MKR:DELTA-VALUE1? :MKR:DELTA-VALUE2?

Query the Trace 1 / 2 delta value.

Parameter: None

Response: The trace 1 delta value as a real number.

Example: Trace 1 value set to 100:

```
100
```

:MKR:DELTA-USE-MARKER

Set the Current Marker Value as the nominal

Parameter: None

Response: None

Common Commands

:MKR:RELATIVE-RESULT?

Returns the result at the Relative Marker

Parameter: None

Response: ???

:MKR:DELTA-RESULT?

Returns the result of the Delta Marker

Parameter: None

Response: ???

:MKR:RELATIVE-MARKER <interger>

Set the marker to use for the relative marker calculations.

Parameter: An integer in the range 1 to 8.

Response: None

Example: Set marker 1 for relative marker calculations:

```
:ANA:MKR:RELATIVE-MARKER 1
```

:MKR:RELATIVE-MARKER?

Query the relative marker number.

Parameter: None

Response: The marker number as an integer.

:MKR:RESULT?

Query a measurement result at the Active Marker position.

Parameter: None

Response: The Trace 1 and Trace 2 result for the currently selected marker.

Example: Where the Trace 1 value is 924.96 and the Trace 2 value is -0.7491.

```
9.24963156e+002, -7.49138398e-001
```

Peak Search Functions

:MKR:SEARCH-TYPE <integer>

Select Search Type as Peak or Dip

Parameter: `0` Peak search

`1` Dip search

Response: None

Example: Select Search Type as Peak

```
:ANA:MKR:SEARCH-TYPE 0
```

:MKR:SEARCH-TYPE?

Query the Search Type

Parameter: None

Response:

0	Peak search.
1	Dip search.

:MKR:SEARCH-TRACE <integer>

Select the Trace to use for peak/dip searching

Parameter:

1	Trace 1
2	Trace 2

Response: None

Example: Select Trace 1 for peak/dip searching:

```
:ANA:MKR:SEARCH-TRACE 1
```

Note: the `:ANA:MKR:SEARCH-TYPE` command is used to select Peak Search or Dip Search

:MKR:SEARCH-TRACE?

Query the trace used for peak/dip searching

Parameter: None

Response:

1	Trace 1
2	Trace 2

:MKR:SEARCH-FIND

Move the Active Marker to the peak / dip

Parameter: None

Response: None

Example

```
:ANA:MKR:SEARCH-FIND
```

:MKR:SEARCH-LEFT

Move the Active Marker to the next peak / dip to the left

Parameter: None

Response: None

Example: Move the Active Marker to the next left

Common Commands

```
:ANA:MKR:SEARCH-LEFT
```

:MKR:SEARCH-RIGHT

Move the Active Marker to the next peak / dip to the right

Parameter: None

Response: None

Example: Move the Active Marker to the next right

```
:ANA:MKR:SEARCH-RIGHT
```

:MKR:SEARCH-NEXT-HIGH

Move the Active Marker to the next highest peak / dip

Parameter: None

Response: None

Example: Move the Active Marker to the next highest

```
:ANA:MKR: SEARCH-NEXT-HIGH
```

:MKR:SEARCH-NEXT-LOW

Move the Active Marker to the next lowest peak / dip.

Parameter: None

Response: None

Example: Move the Active Marker to the next lowest

```
:ANA:MKR:SEARCH-NEXT-LOW
```

1.14 /E Equivalent Circuit Analysis Option

DISPLAY <disc>

Show/Hide Equivalent Circuit mode dialog box

Parameter: `ON` Show Equivalent Circuit mode dialog box

`OFF` Hide Equivalent Circuit mode dialog box

Response: None

Example Show Equivalent Circuit mode dialog box:

```
:ANA:EC:DISPLAY ON
```

CCT <integer>

Set the Equivalent Circuit type

Parameter: `1` Circuit 1

`2` Circuit 2

`3` Circuit 3

`4` Circuit 4

`5` Circuit 5

Response: None

Example Set circuit 5:

```
:ANA:EC:CCT 5
```

CCT?

Query the Equivalent Circuit type

Parameter: None

Response: `1` Circuit 1

`2` Circuit 2

`3` Circuit 3

`4` Circuit 4

`5` Circuit 5

R1 <real>

Set the R1 Equivalent Circuit component value. (only when :ANA:EC:MODE is set to SET)

Parameter Set the value of R1 as a real number in ohms

Response: None

Example: Set R1 to 1kohm

```
:ANA:EC:R1 1000
```

R1?

Query the R1 Equivalent Circuit component value

Parameter: None

Response Value of R1 as a real number

Example: For R1 to 1kohm

```
:ANA:EC:R1?
1.000000000e+003
```

C1 <real>

Set the C1 Equivalent Circuit component value. (only when :ANA:EC:MODE is set to SET)

Parameter Set the value of C1 as a real number

Response: None

Example: Set C1 to 10pF

```
:ANA:EC:C1 10e-12
```

C1?

Query the C1 Equivalent Circuit component value

Parameter: None

Response Value of C1 as a real number

Example:

```
:ANA:EC:C1?
10.000e-12
```

L1 <real>

Set the L1 Equivalent Circuit component value. (only when :ANA:EC:MODE is set to SET)

Parameter Set the value of L1 as a real number

Response: None

Example: Set L1 to 10uH

```
:ANA:EC:L1 10e-6
```

Common Commands

L1?

Query the L1 Equivalent Circuit component value

Parameter: None

Response Value of L1 as a real number

Example:

```
:ANA:EC:L1?

10.000e-12
```

C0 <real>

Set the C0 Equivalent Circuit component value.

Parameter Set the value of C0 as a real number

Response: None

Example: Set C0 to 10pF

```
:ANA:EC:C0 10e-12
```

Note: `C0?` Is only available after `:ANA:EC:MODE SET` and `ANA:EC:CCT 5` commands have been sent i.e. the Equivalent Circuit Mode is set to Auto Mode and the Equivalent Circuit type as been set to Circuit 5

C0?

Query the C0 Equivalent Circuit component value.

Parameter: None

Response Value of C0 as a real number

Example1: Set C0 to 10pF in Set Mode

```
+10.000e-12
```

Example2: C0 is calculated as 10pF in Auto Mode

```
+10.000e-12
```

Note: `C0?` Is only available after `:ANA:EC:CCT 5` command has been sent i.e. the Equivalent Circuit type as been set to Circuit 5

Common Commands

TRACE <disc>

Turn Equivalent Circuit traces on and off

Parameter	ON	Turn Equivalent Circuit traces on
	OFF	Turn Equivalent Circuit traces off
Response:	None	
Example:	Turn Equivalent Circuit traces on	
	:ANA:EC:TRACE ON	

TRACE?

Query Equivalent Circuit trace state

Parameter:	None	
Response	1	EC trace on
	0	EC trace off

CALC-PARS

Calculate Equivalent Circuit Parameters

Parameter:	None
Response:	None
Example:	Update EC trace

:ANA:EC:CALC-PARS

MODE <disc>

Select Equivalent Circuit Mode

Parameter	SET	Set Mode
	AUTO	Auto Mode
Response:	None	
Example:	Select Auto Mode	
	:ANA:EC:MODE AUTO	

MODE?

Query Equivalent Circuit Mode

Parameter:	None	
Response:	0	Set Mode
	1	Auto Mode

Common Commands

POINT? <integer>

Query a point on the Equivalent Circuit trace

Parameter The required measurement point as an integer

Response The measurement parameter of the point, the first result and the second result in comma separated form

Example Retrieve the measurement result of the first measurement point:

```
:ANA:EC:POINT? 0
1.00000000e+003,9.24710841e+002, 5.68111232e-002
```

RESULT? <real>

Query the Equivalent Circuit result nearest to the defined X-axis value

Parameter: The X-axis value as a real number

Response: The measurement results nearest to the supplied X-axis value as:

Nearest X-axis value to the parameter value, the first result and the second result in comma separated form

Example Retrieve the measurement result nearest to the frequency parameter 10kHz.

```
:ANA:EC:RESULT? 10k
9.43609621e+003, 9.24650318e+002, 3.98660591e-002
```

1.15 /K Materials Test Option

Materials Function – (MATerials:)

TYPE <disc>

Select the Relative Permittivity test type

Parameter: `E-CONT` Permittivity Contact Method

`E-NONCONT` Permittivity Non-Contact Method

Response: None

Example: Select Permittivity Contact Method

```
:MAT:TYPE E-CONT
```

TYPE?

Query the Relative Permittivity test type

Parameter: None

Response: **1** Permittivity Contact Method

2 Permittivity Non-Contact Method

D <real>

Set the Guard Electrode diameter ‘d’ in mm

Parameter: The value of ‘d’ as a real number

Response: None

Example: Set ‘d’ to 32mm

```
:MAT:D 32.0
```

D?

Query the Guard Electrode diameter ‘d’

Parameter: None

Response: The value of ‘d’ as a real number

Example: When the value of ‘d’ is set to 32mm

```
32.000000
```

CONTact-TM <real>

Set the Material Thickness ‘tm’ in mm (Contact Method)

Parameter: The value of ‘tm’ as a real number

Response: None

Example: Set ‘tm’ to 2mm

```
:MAT:CONT-TM 2.0
```

Common Commands

CONTact-TM?

Query the material thickness ‘tm’ in mm (Contact Method)

Parameter: None

Response: The value of ‘tm’ as a real number

Example: When the value of ‘tm’ is 2mm

```
2.00000e+000
```

TG <real>

Set the Electrode Separation ‘tg’ in mm (Non-Contact Method)

Parameter: The value of ‘tg’ as a real number

Response: None

Example: Set ‘tg’ to 4mm

```
:MAT:TG 4.0
```

TG?

Query the Electrode Separation ‘tg’ in mm (Non-Contact Method)

Parameter: None

Response: The value of ‘tg’ as a real number

Example: When ‘tg’ is set to 4mm

```
0.40000E+1
```

NONCONTact-TM <real>

Set the Material Thickness ‘tm’ in mm (Non-Contact Method)

Parameter: The value of ‘tm’ as a real number

Response: None

Example: Set ‘tm’ to 2mm

```
:MAT:NONCONT-TM 2.0
```

NONCONTact-TM?

Query the Material Thickness ‘tm’ in mm (Non-Contact Method)

Parameter: None

Response: The value of ‘tm’ as a real number

Example: When ‘tm’ is set to 2mm

```
0.20000E+1
```

MEASure-CG

Measure the Capacitance Without MUT ‘Cg’

Parameter: None

Common Commands

Response: None

MEASure-CG?

Query the Capacitance Without MUT 'Cg'

Parameter: None

Response:

1	Cg data valid
0	Cg data not valid

N <integer>

Set the Number of Turns 'N'

Parameter: The value of 'N' as an integer

Response: None

Example: Set 'N' to 4

```
:MAT:N 4
```

N?

Query the Number of Turns 'N'

Parameter: None

Response: Value of 'N' as an integer

Example: When N is set to 4

```
4
```

L <real>

Set the Average Path Length 'l' in mm

Parameter: The value of 'l' as a real number

Response: None

Example: Set 'l' to 14mm

```
:MAT:L 14.0
```

L?

Query the Average Path Length 'l' in mm

Parameter: None

Response: Value of 'l' as a real number

Example: When 'l' is set to 14mm

```
1.400000e+001
```

A <real>

Set the Cross Sectional Area of toroid 'A' in mm^2

Common Commands

Parameter: The value of 'A' as a real number

Response: None

Example: Set 'A' to 10mm^2

```
:MAT:A 10.0
```

A?

Query the Cross Sectional Area of toroid 'A' in mm^2

Parameter: None

Response: Value of 'A' as a real number

Example: When 'A' is set to 10mm^2

```
1.0000000e+001
```

Materials Function – (MATerials:)

MEASure-LR

Measure L_W/R_W reference data.

Parameter: None

Response: None

MEASure-LR?

Query L_W/R_W reference data status

Parameter: None

Response:

1	L_W/R_W data valid
0	L_W/R_W data not valid

Analysis Mode –(ANAlysis)

PROPerty1 <disc> PROPerty2 <disc>

Select the Measurement Property for Trace 1 / 2

Parameter:

L	Inductance	C	Capacitance
R	Resistance	Z	Impedance.
Y	Admittance	X	Reactance.
G	Conductance.	B	Susceptance.
Q	Q-factors	D	D-factor.
ANGLE	Angle.		
EPR	Complex Permittivity-Real.		
EPPR	Complex Permittivity-Imag.		
DE	D-factor (Permittivity).		
UPR	Complex Permeability –Real.		

UPPR	Complex Permeability –Imag
DU	D-factor (Permeability

Response: None

PROPerty1? PROPerty2?

Query the Trace 1 / 2 Measurement Property

Parameter: None.

Response:

0	Inductance	1	Capacitance
2	Resistance	3	Impedance.
4	Admittance	5	Reactance.
6	Conductance	7	Susceptance
8	Q-factors	9	D-factor
10	Angle		
11	Complex Permittivity-Real		
12	Complex Permittivity-Imag		
13	D-factor (Permittivity)		
14	Complex Permeability –Real		
15	Complex Permeability –Imag		
16	D-factor (Permeability		

Meter Mode –(METer:)

FUNCtion:1 <disc> FUNCtion:2 <disc>

Select Function (Term) 1 / 2 Measurement Parameter

Parameter:

L	Inductance	C	Capacitance
R	Resistance	Z	Impedance
Y	Admittance	X	Reactance
G	Conductance	B	Susceptance
Q	Q-factors	D	D-factor
ANGLE	Angle		
EPR	Complex Permittivity-Real		
EPPR	Complex Permittivity-Imag		
DE	D-factor (Permittivity)		
UPR	Complex Permeability –Real		
UPPR	Complex Permeability –Imag		

Common Commands

DU	D-factor (Permeability

Response: None

FUNC:1? FUNC:2?

Query the Function (Term) 1 / 2 Measurement Parameter

Parameter: None.

Response:

0	Inductance	1	Capacitance
2	Resistance	3	Impedance
4	Admittance	5	Reactance
6	Conductance.	7	Susceptance
8	Q-factors	9	D-factor
10	Angle		
11	Complex Permittivity-Real		
12	Complex Permittivity-Imag		
13	D-factor (Permittivity)		
14	Complex Permeability –Real		
15	Complex Permeability –Imag		
16	D-factor (Permeability		

1.16 /Y Polar Complex Plots

DISPLAY-MODE <discrete>

Select the Display Mode

Parameter:	COMB	Combined
	SPLIT	Split
	POLAR	Polar
	COMPLEX	Complex
Response:	None	
Example:	Set Polar mode	
	:ANA:DISPLAY-MODE POLAR	

Note:

DISPLAY-MODE?

Query the Display Mode

Parameter:	None	
Response:	0	Combined
	1	Split
	2	Polar
	3	Complex

POLAR PLOT

POLAR-PROPerty <discrete>

Select the measurement Parameter for the polar plot.

Parameter	Z	Measure Z and angle
	Y	Measure Y and angle
Response:	None	
Example:	Set Parameter to Y/angle	
	:ANA:POLAR-PROP Y	

POLAR-PROPerty?

Query the measurement Parameter of the polar plot.

Parameter:	None

Response	`0`	Z/angle
	`1`	Y/angle

POLAR-SCALE <real>

Set the Polar Plot Scale

Parameter: Set the Polar Plot Scale as a real number

Response: None

Example: Set Polar Plot Scale to 1kΩ/division

```
:ANA:POLAR-SCALE 1000
```

POLAR-SCALE?

Query the Polar Plot Scale

Parameter: None

Response: Value of Polar Plot Scale as a real number

Example: When the Polar Plot Scale is set to 1kΩ/division

```
1.000000e+3
```

POLAR-DIVisionFullScale <integer>

Set the number of divisions for full scale on the polar plot

Parameter: Set the number of divisions for full scale as an integer number

Response: None

Example: Set number of divisions to 5

```
:ANA:POLAR-DIVFS 5
```

POLAR-DIVisionFullScale?

Query the number of divisions for full scale on the polar plot

Parameter: None

Response: Value of the number of divisions as an integer

Example: When the number of divisions is set to 5

```
5
```

POLAR-FRaMe <discrete>

Enable/disable the Cursor Frame on the polar plot.

Parameter	`OFF`	Disable the Cursor Frame
	`ON`	Enable the Cursor Frame

Response: None

Example: Enable the Cursor Frame

```
:ANA:POLAR-FRM ON
```

POLAR-FRaMe?

Query the Cursor Frame status on the polar plot

Parameter: None

Response		
	0	OFF
	1	ON

POLAR-FIT <integer>

Autofit the Polar Plot

Parameter		
	1	Round Scale
	2	Full Scale divisions to 5

Response: None

Example: Set the number of divisions for full scale to 5.

```
:ANA:POLAR-FIT 2
```

LOG-SWeePPARameter <disc>

Select Logarithmic or Linear Sweep

Parameter:		
	ON	Logarithmic Sweep
	OFF	Linear Sweep

Response: None

Example: Set Logarithmic Sweep

```
:ANA:LOG-SWPPAR ON
```

LOG-SWeePPARameter?

Query the Sweep setting

Parameter: None

Response:		
	0	Logarithmic Sweep
	1	Linear Sweep

COMPLEX PLOT

COMPLEX-PROPerty <disc>

Common Commands

Select Measurement Parameters for the complex plot.

Parameter: `R-X` Measure Rs and Xs

`G-B` Measure Gp and Bp

`ZP-ZPP` Measure Z' and Z''

Response: None

Example: Set measure parameters to Rs/Xs

```
:ANA:COMPLEX-PROP R-X
```

COMPLEX-PROPerty?

Query the Measurement Parameters of the complex plot

Parameter: None

Response: `0` Rs/Xs

`1` Gp/Bp

`2` Z'/Z''

COMPLEX-FrameWidth <real>

Set the Frame Width (and height) of the complex plot

Parameter: Set the width & height of the complex frame as a real number

Response: None

Example: Set the frame width to 10kR

```
:ANA:COMPLEX-FW 10k
```

COMPLEX-FrameWidth?

Query the Frame Width of the complex plot

Parameter: None

Response: Value of the width as a real number

Example: When the frame width is set to 10kR

```
1.000000e+004
```

COMPLEX-FrameCentreX <real>

Set the X-axis Frame Centre of the complex plot

Parameter: Set the X-axis Centre of the complex plot frame as a real number

Response: None

Example: Set the X-axis frame centre to 5kR

```
:ANA:COMPLEX-FCX  5000
```

Common Commands

COMPLEX-FrameCentreX?

Query X-axis Frame Centre of the complex plot

Parameter: None

Response: Value of the X-axis Frame Centre as a real number

Example: When the X-axis Frame Centre to 5kR

```
5.000000e+003
```

COMPLEX-FrameCentreY <real>

Set the Y-axis Frame Centre of the complex plot

Parameter: Set the Y-axis Frame Centre of the complex plot frame as a real number

Response: None

Example: Set the Y-axis frame centre to 5kR

```
:ANA:COMPLEX-FCY 5k
```

COMPLEX-FrameCentreY?

Query the Y-axis Frame Centre of the complex plot

Parameter: None

Response: Value of the Y-axis Frame Centre as a real number

Example: When the Y-axis frame centre is set to 5kR

```
5.000000e+003
```

COMPLEX-FIT

Fit the complex plot to the display area

Parameter: None

Response: None