Contents

SPECTRUM ANALYZERS

3250 Series

EMI Measurement
User Manual

Document part no. 47090/029

SPECTRUM ANALYZERS
3250 SERIES
EMI Measurement
User Manual

Manual part no. 47090/029 (PDF version)
Issue 1

15 January 2010

About this manual

This manual explains how to use the EMI Measurement option for the 3250 Series Spectrum Analyzers.

Intended audience

Persons engaged on work relating to the design and manufacture of RF and microwave sub-systems and modules, or the installation and maintenance of those systems.

It is assumed that the user is familiar with the terms used in RF and microwave measurements.

Structure

Chapter 1

Introduction and licensing information.

Chapter 2

Menu tree, listing all available menus.

Chapter 3

Detailed description of menus.

Chapter 4

Description of operation of the instrument.

Chapter 5

Listing of all commands for remote operation, with associated parameters.

Appendix A

List of remote commands.

Appendix B

List of error codes.

Document conventions

The following conventions apply throughout this manual:

CAPS Capitals are used to identify names of controls and panel markings.

[CAPS] Capitals in square brackets indicate hard key titles.

[Italics] Italics in square brackets indicate soft key titles.

Associated publications

- **3250 Series Operating Manual**
  (PDF version 46892/974, printed version 46882/974)

Contents

Precautions

This document is intended to be used in conjunction with the 3250 Series Operating Manual, which contains a full list of safety precautions. Please ensure that you are familiar with these precautions before using the instrument.

Chapter 1
GENERAL INFORMATION

Contents

General

This option allows you to measure the conducted emission of commercial electrical/electronic products. This user manual describes how to set up the system to measure EMI, and the operation of each menu.

Note that the EMI measurement software must be installed on the system in order to use the EMI measurement option.

Licensing the EMI measurement software

When you add a new option, or update an existing option, you receive the updated version of all your current options, since they are reloaded simultaneously. This process may also require you to update the spectrum analyzer program so that it is compatible with the new option.

If your analyzer came with the EMI measurement already licensed, you can skip this licensing procedure.

Keep a copy of your license key number in a secure location. If you lose your license key number, call your nearest service or sales office for assistance.

Use one of the two following methods to activate the software option.

Activation key authentication code

1 Connect a keyboard and mouse to the PS2 ports or the USB ports.

2 Turn on the signal analyzer. Wait until the analyzer completes the power-up sequence.

3 Press [System], *[Option Info.]*, *[Option Activate]*.

4 Select the ‘EMC’ field in the license active dialog window.

Note: all purchased options must be selected.

5 Enter the letters/digits of your 32-character license code using the mouse or the keyboard. The license key number is a hexadecimal number.

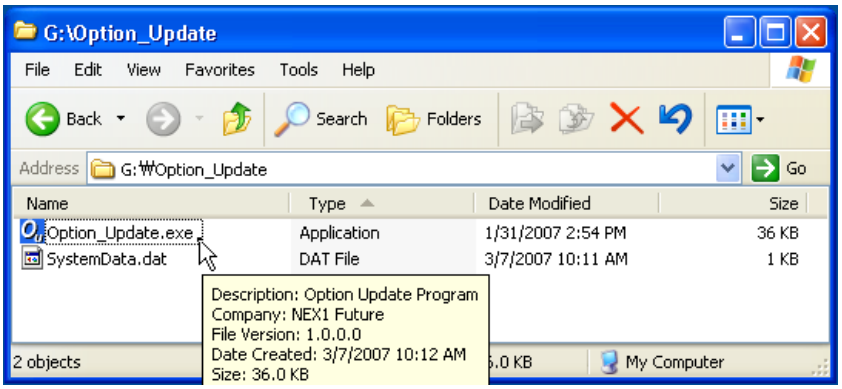
6 Press Activate.

7 Licensing is successfully completed when the Activation Success dialog window is displayed. If ‘Invalid License!’ is displayed, enter the correct license code again.

8 Press OK or any key to exit the license menu.

Authenticating using an external program

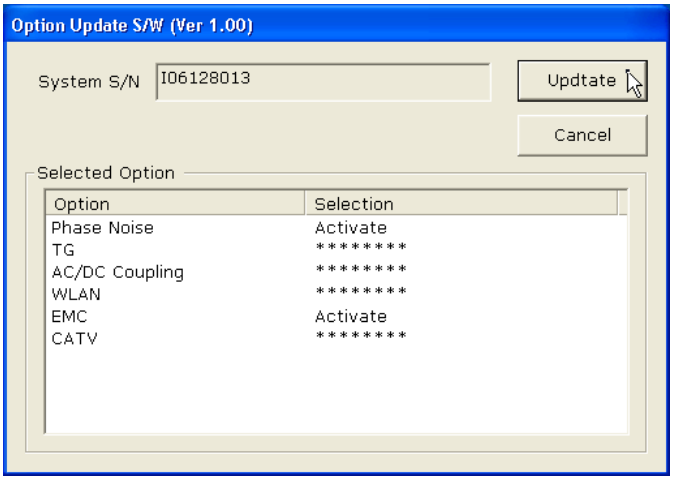
1 Contact the service center or sales office to receive the updating program and key code.



2 Load the option updating program and key code onto a USB memory stick or other storage device and connect it to the signal analyzer.

3 If the signal analyzer program is running, press the **Close** button to close it.

4 Execute *Option_Update.com*



5 Check the equipment's serial number and authentication options, then click **Update**.

6 If the update is successful, the **Cancel** button is replaced with **Done**.

7 Press **Done**.

8 Double-click the shortcut icon on the signal analyzer's desktop to restart the main program.

Chapter 2
MENU TREE

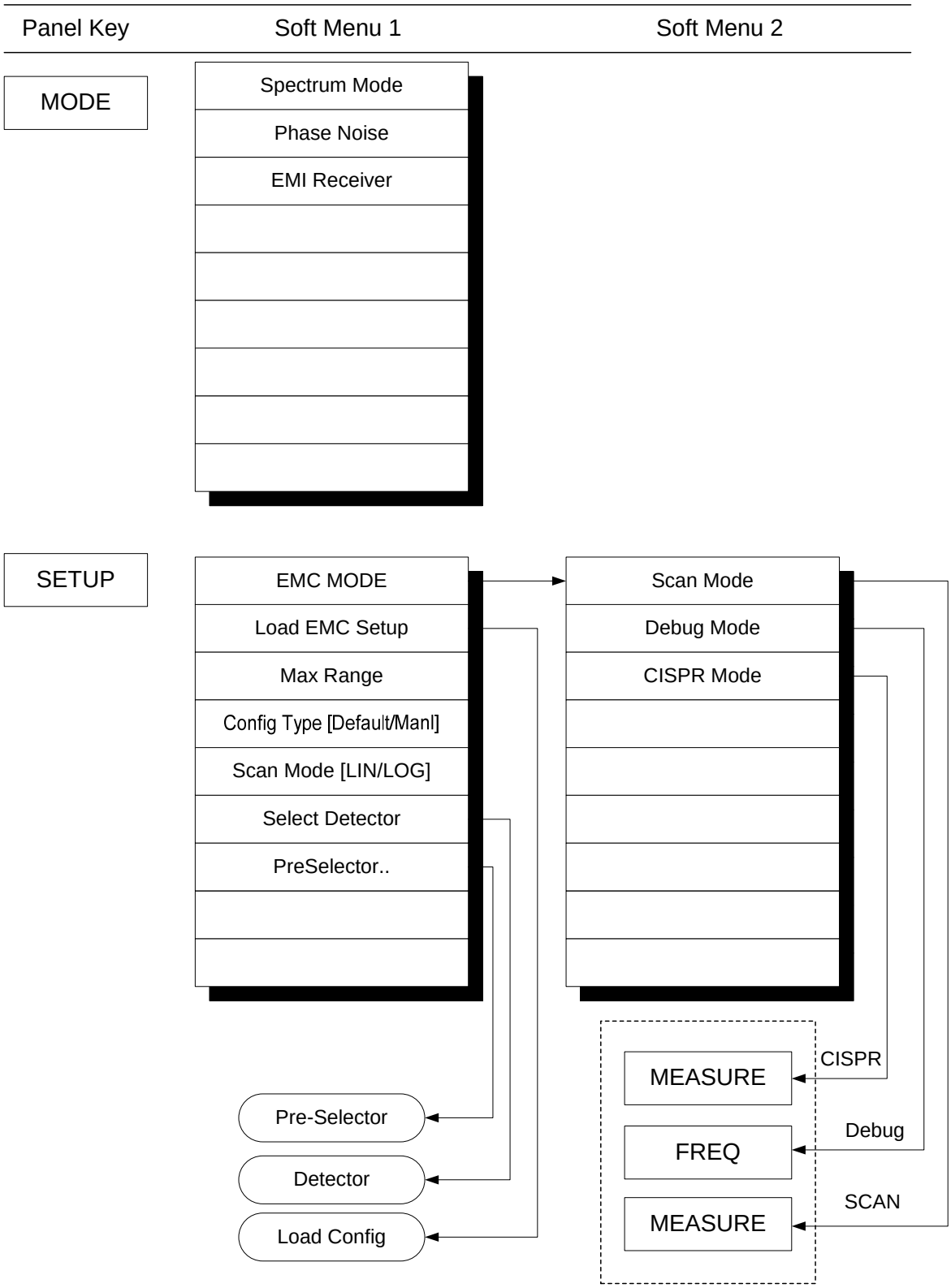
Introduction

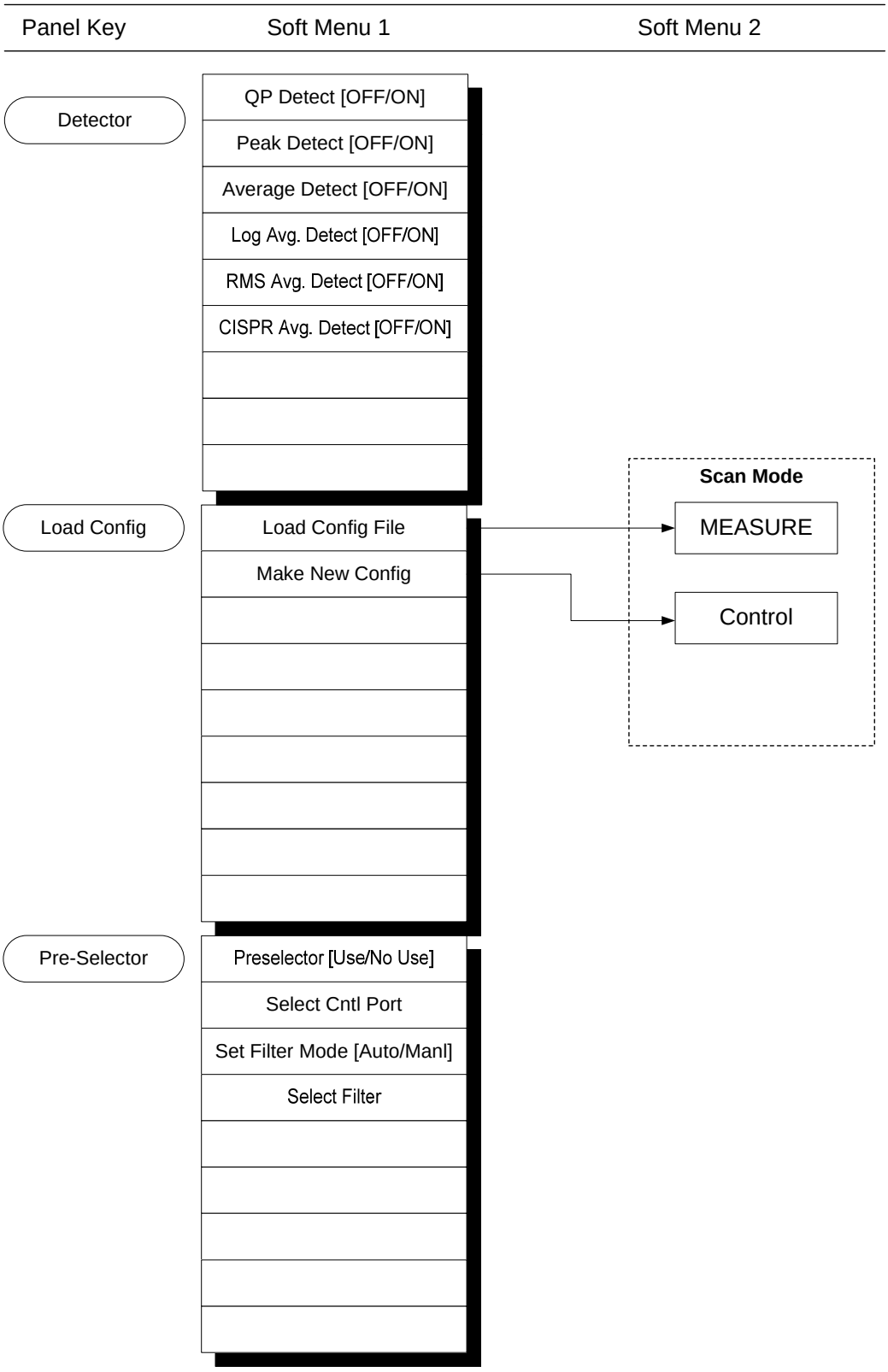
In this section, the function of soft menus, and their hierarchy in the system, are described using a menu tree. This is for the EMI measurement option only: refer to the Operating Manual for information about menus that are not included here.

Note the following general operational points about the menu tree:

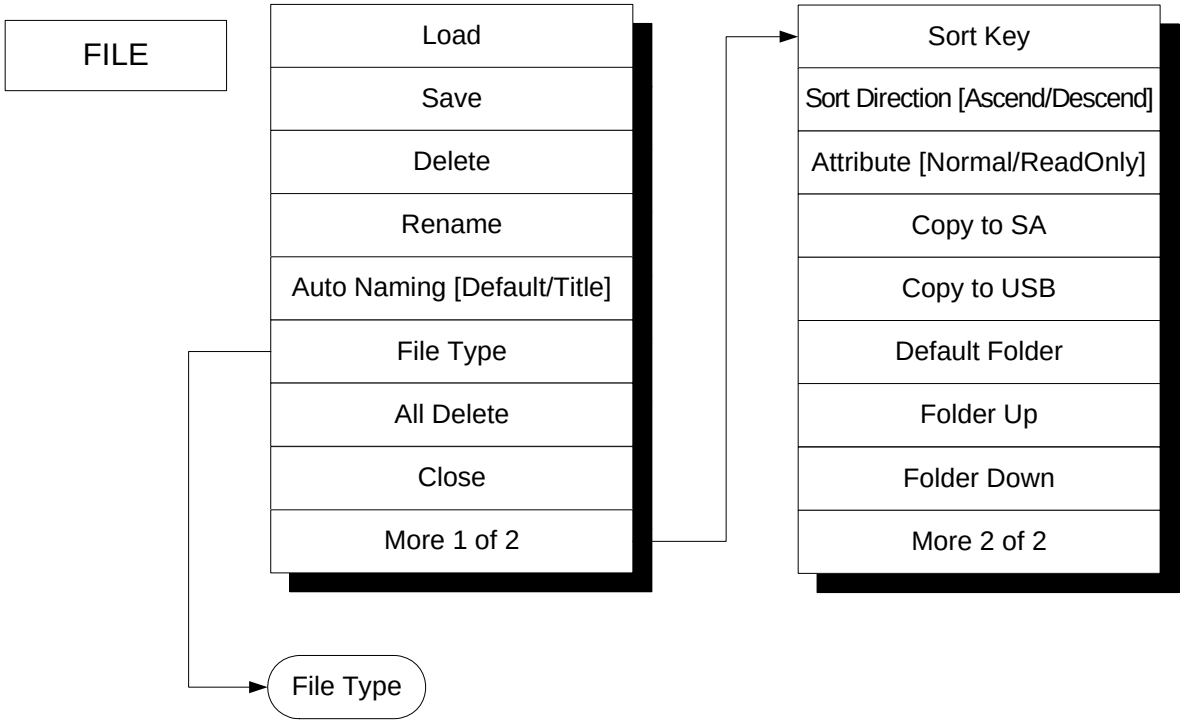
- **Panel Key** represents a hard key on the front panel.
- **Soft Menu 1** is displayed on the screen when the panel key is pressed. **Soft Menu 2** indicates that there is another menu below **Soft Menu 1**.
- Pressing *[Prev..]* on **Soft Menu 2** takes you back to **Soft Menu 1**.
- Options or function keys that are disabled are indicated by white lettering on the function menu.

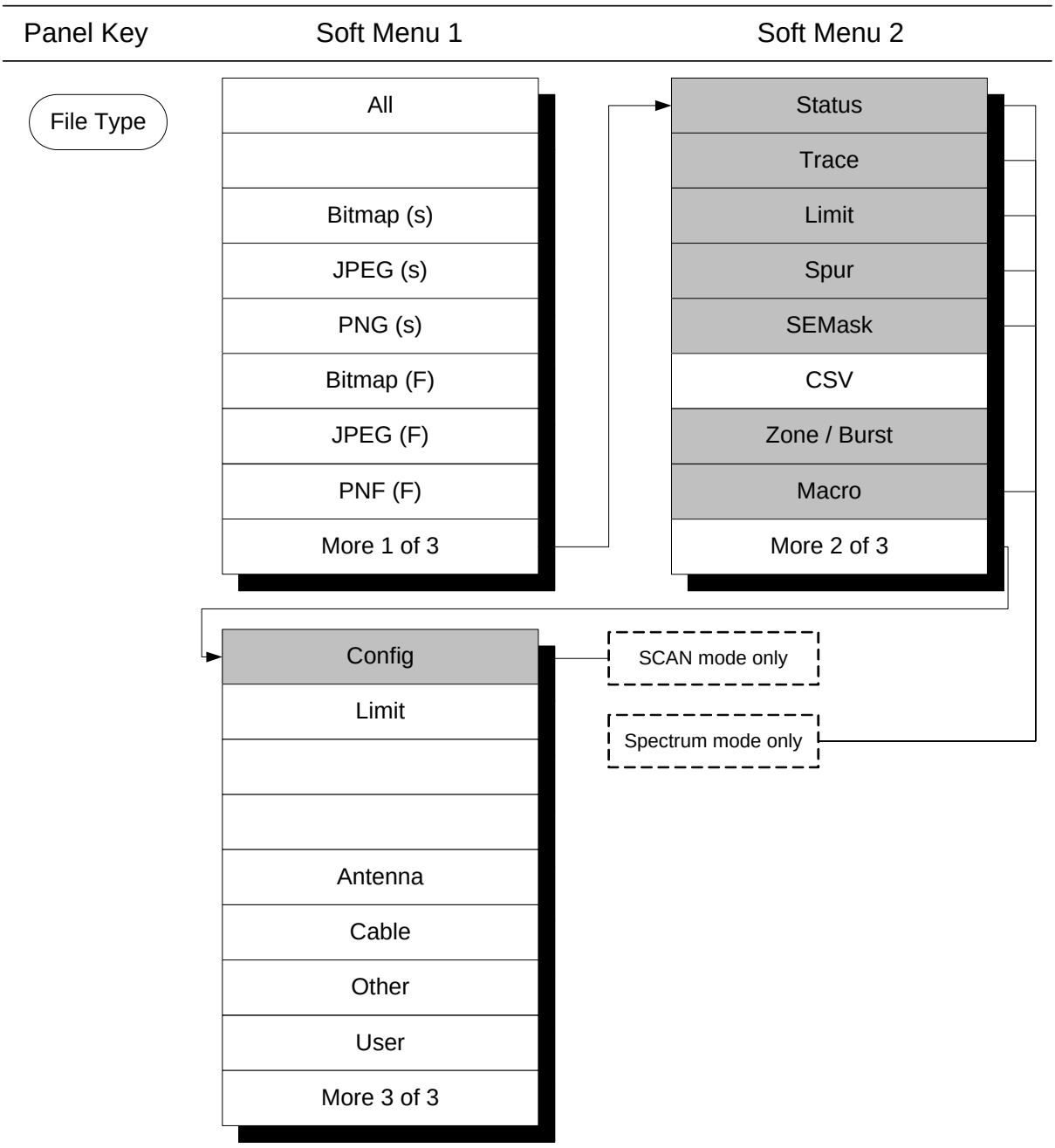
Menu tree

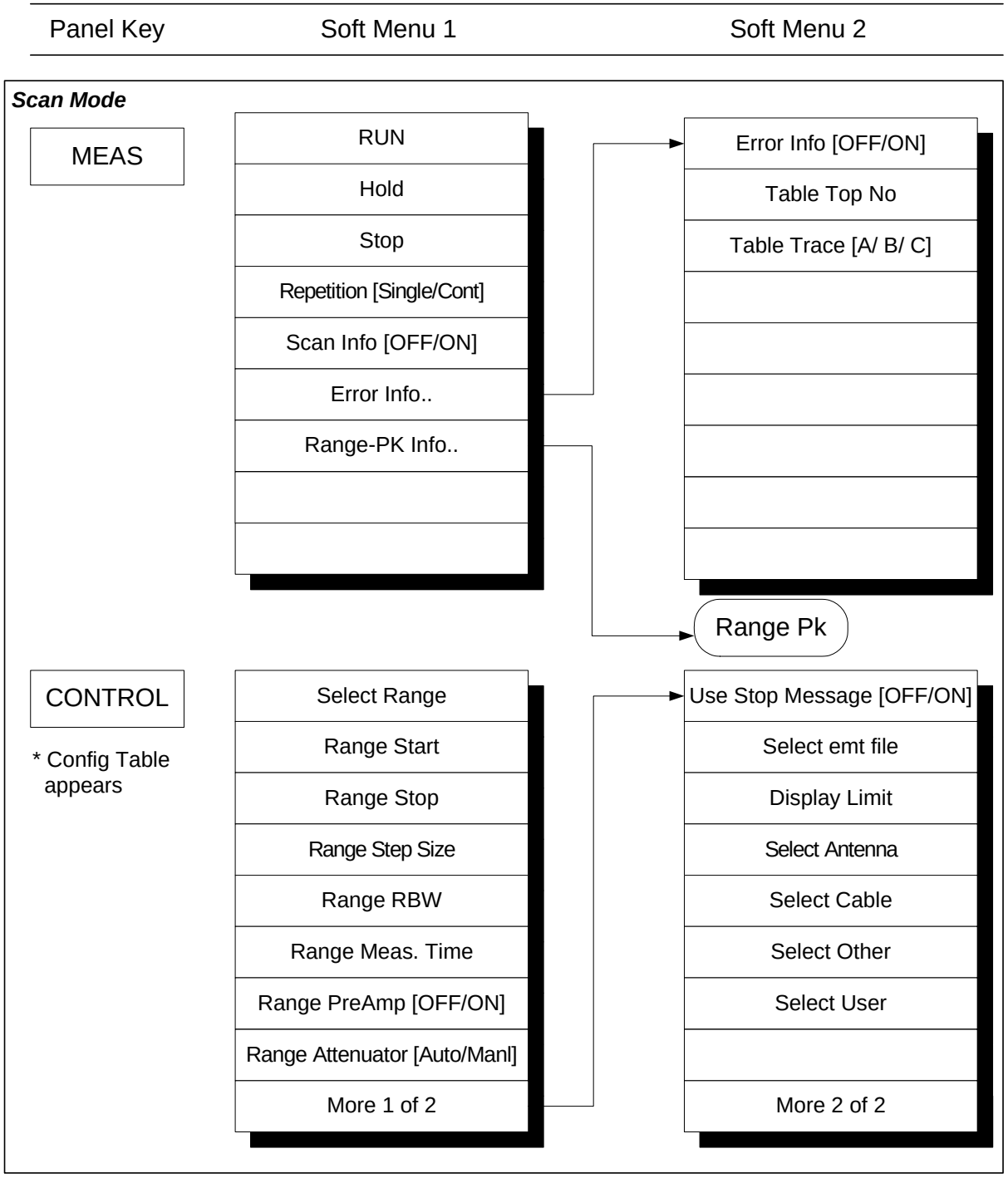

Panel Key
Soft Menu 1
Soft Menu 2
MODE
Spectrum Mode
Phase Noise
EMI Receiver
SETUP
EMC MODE
Load EMC Setup
Max Range
Config Type [Default/Manl]
Scan Mode [LIN/LOG]
Select Detector
PreSelector..
Scan Mode
Debug Mode
CISPR Mode
Pre-Selector
Detector
Load Config
MEASURE
FREQ
MEASURE
CISPR
Debug
SCAN


Panel Key
Soft Menu 1
Soft Menu 2
Detector
QP Detect [OFF/ON]
Peak Detect [OFF/ON]
Average Detect [OFF/ON]
Log Avg. Detect [OFF/ON]
RMS Avg. Detect [OFF/ON]
CISPR Avg. Detect [OFF/ON]
Load Config
Load Config File
Make New Config
Scan Mode
MEASURE
Control
Pre-Selector
Preselector [Use/No Use]
Select Cntl Port
Set Filter Mode [Auto/Manl]
Select Filter

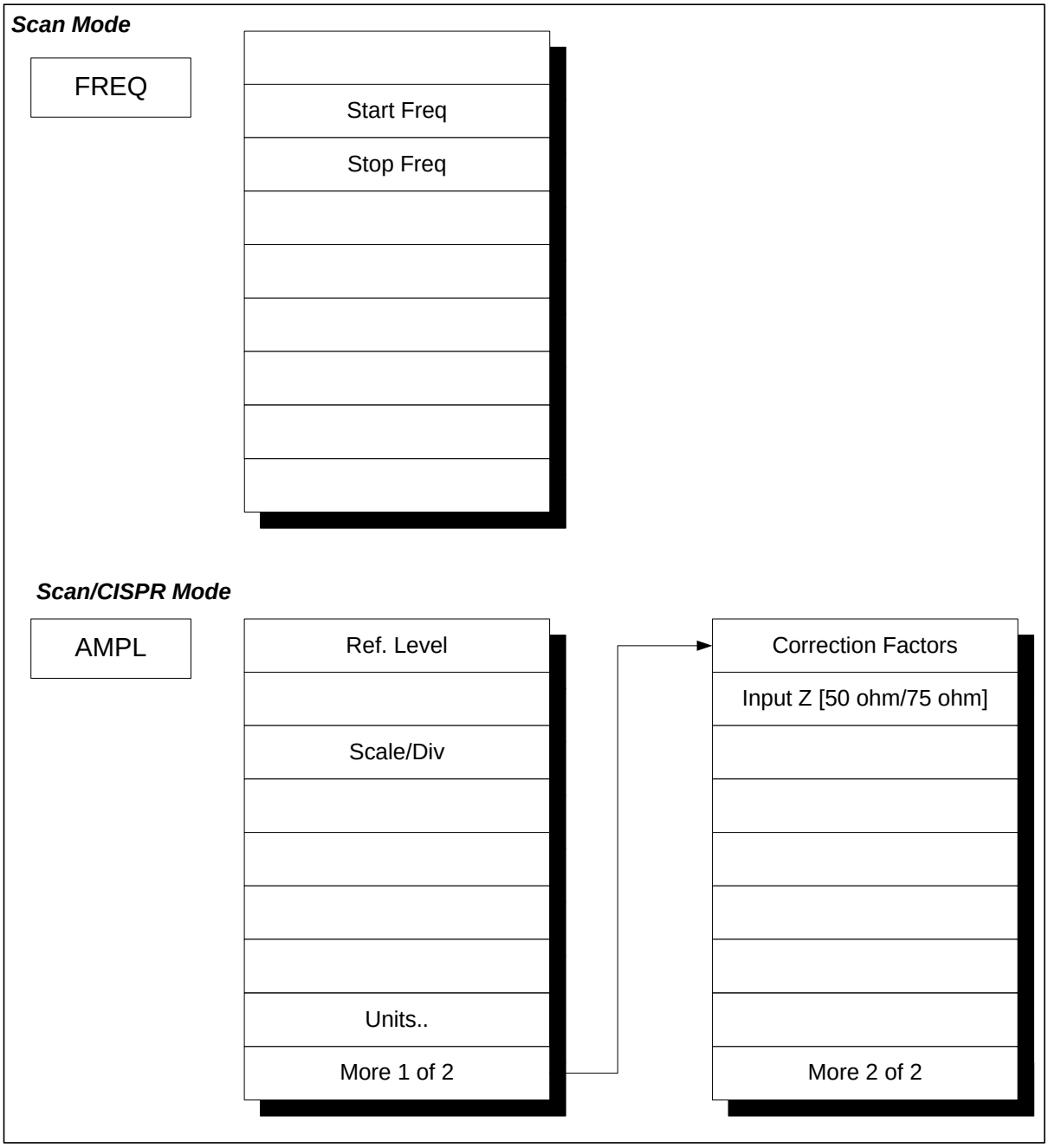
Panel Key	Soft Menu 1	Soft Menu 2

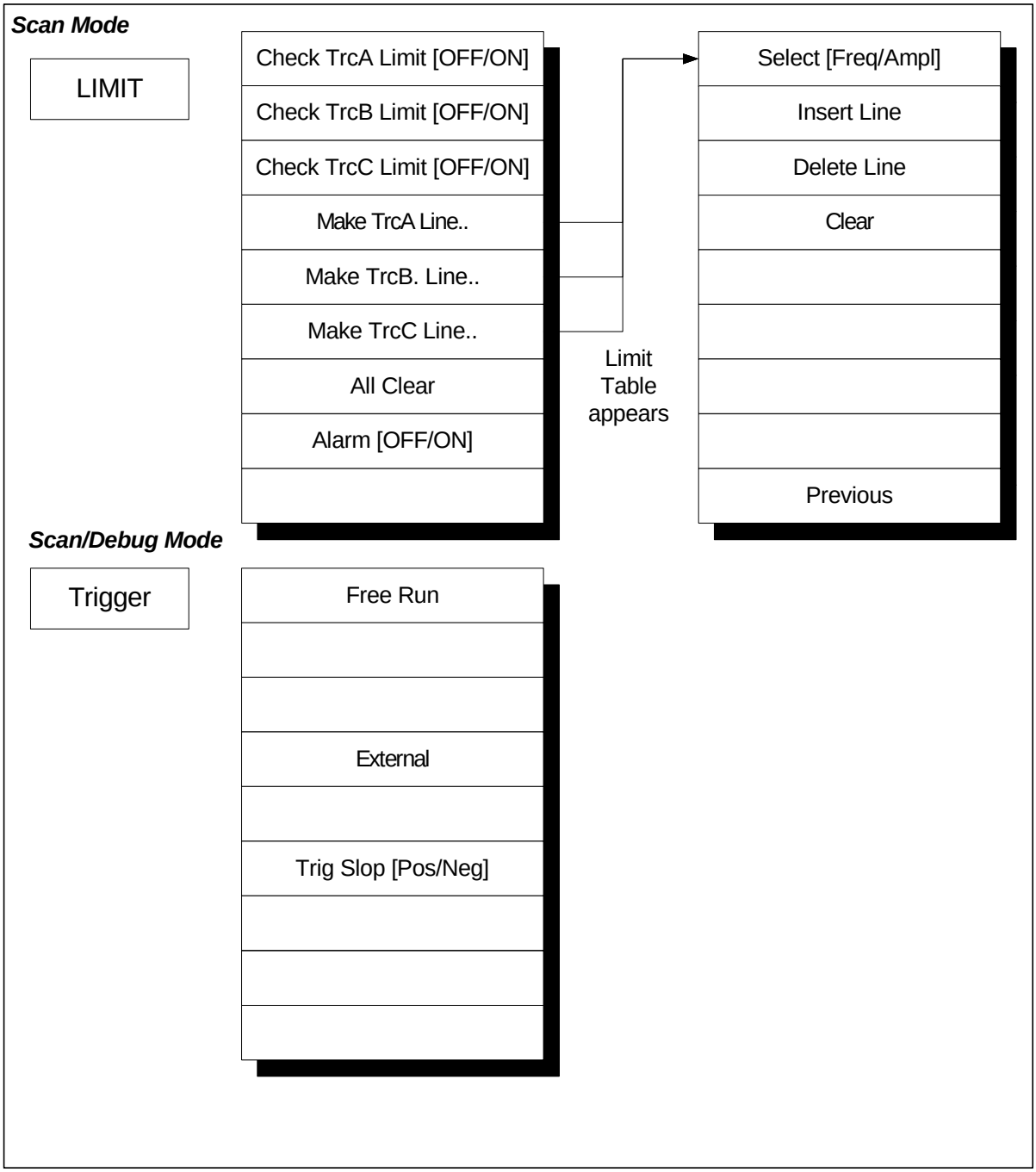



Panel Key
Soft Menu 1
Soft Menu 2
File Type
All
Bitmap (s)
JPEG (s)
PNG (s)
Bitmap (F)
JPEG (F)
PNF (F)
More 1 of 3
Status
Trace
Limit
Spur
SEMask
CSV
Zone / Burst
Macro
More 2 of 3
Config
Limit
Antenna
Cable
Other
User
More 3 of 3
SCAN mode only
Spectrum mode only

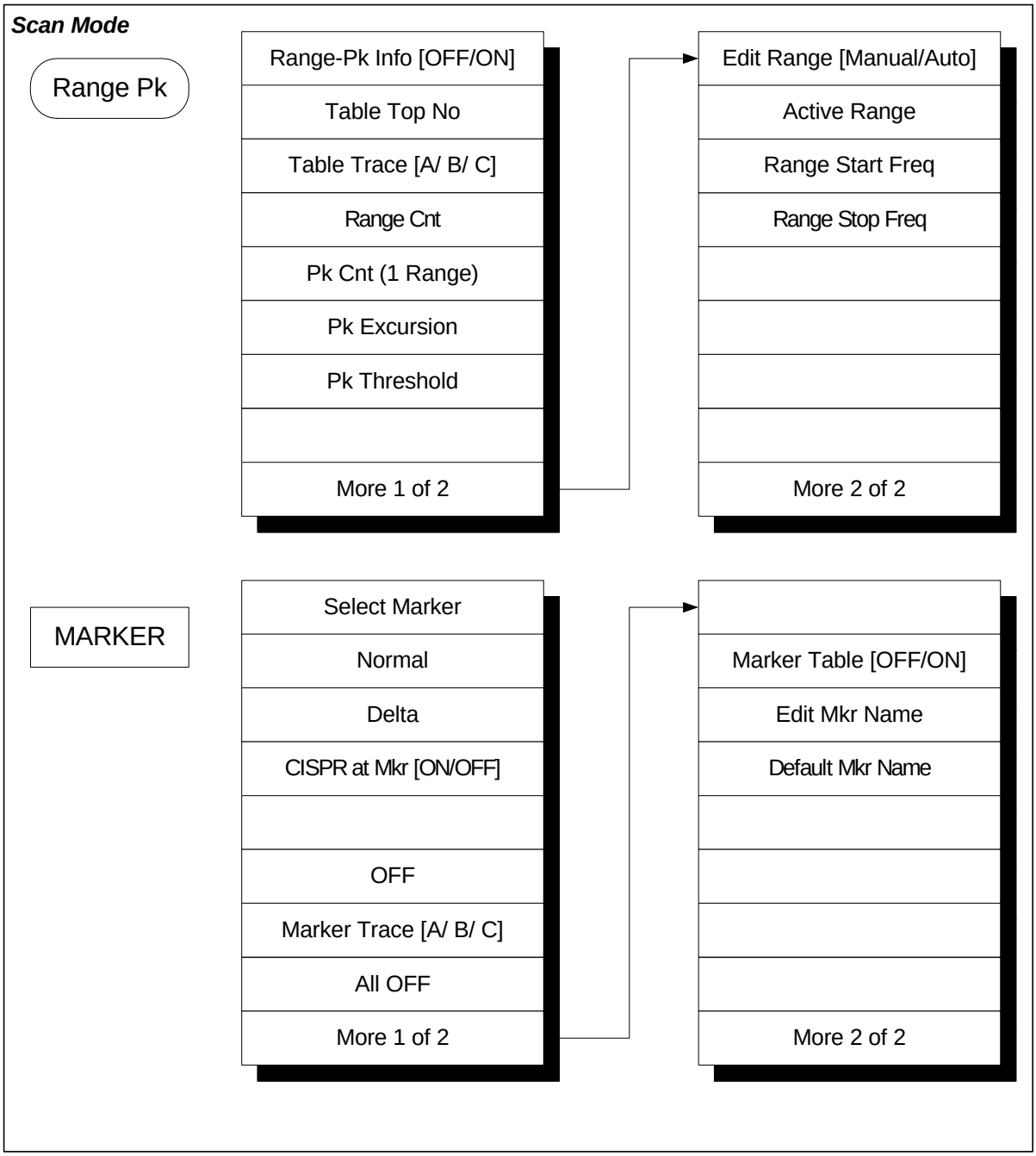

Panel Key
Soft Menu 1
Soft Menu 2
Scan Mode
MEAS
RUN
Hold
Stop
Repetition [Single/Cont]
Scan Info [OFF/ON]
Error Info..
Range-PK Info..
Error Info [OFF/ON]
Table Top No
Table Trace [A/ B/ C]
Range Pk
CONTROL
* Config Table appears
Select Range
Range Start
Range Stop
Range Step Size
Range RBW
Range Meas. Time
Range PreAmp [OFF/ON]
Range Attenuator [Auto/Manl]
More 1 of 2
Use Stop Message [OFF/ON]
Select emt file
Display Limit
Select Antenna
Select Cable
Select Other
Select User
More 2 of 2

Panel Key	Soft Menu 1	Soft Menu 2

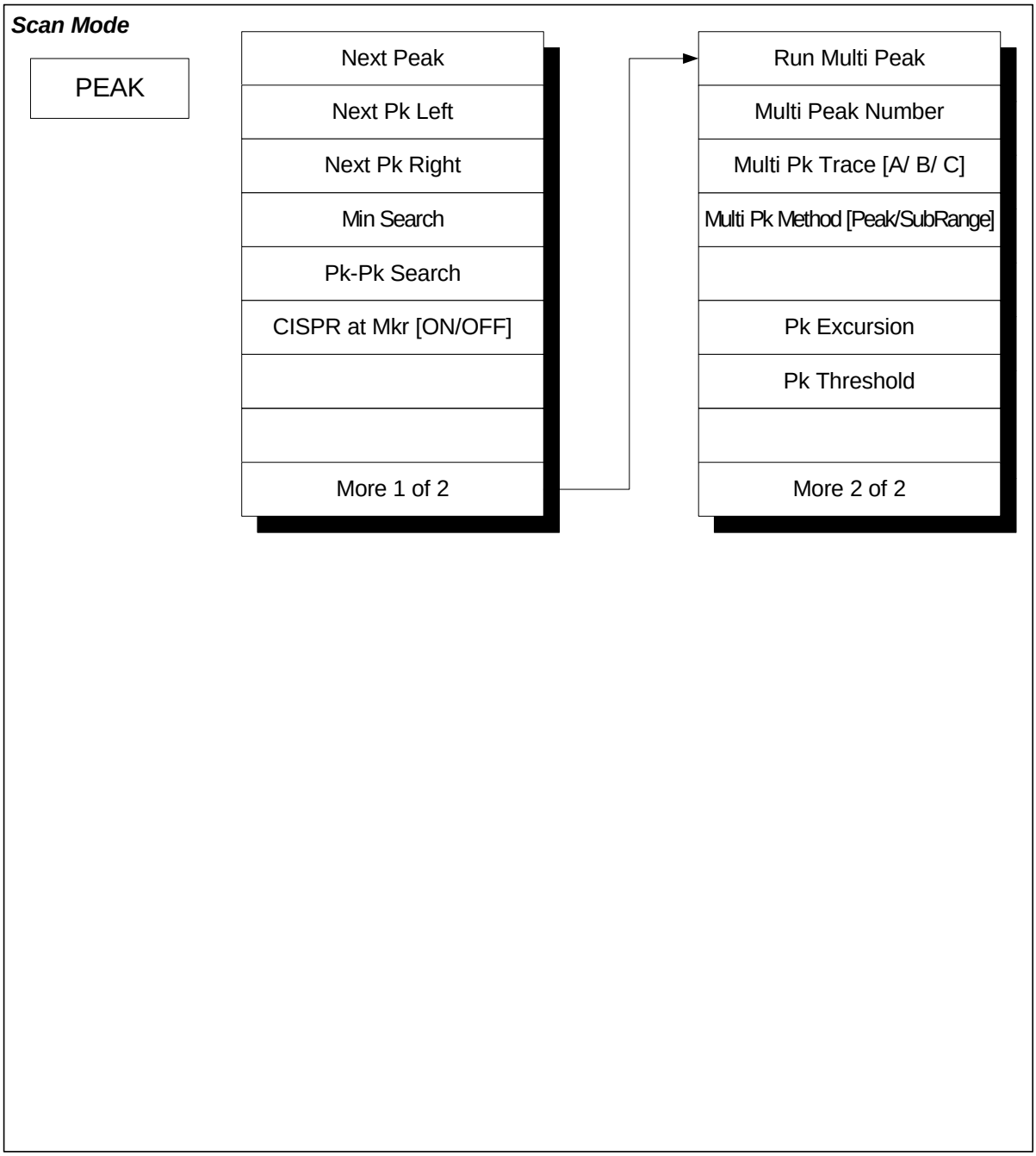



Panel Key
Soft Menu 1
Soft Menu 2
Scan Mode
LIMIT
Check TrcA Limit [OFF/ON]
Check TrcB Limit [OFF/ON]
Check TrcC Limit [OFF/ON]
Make TrcA Line..
Make TrcB. Line..
Make TrcC Line..
All Clear
Alarm [OFF/ON]
Limit Table appears
Select [Freq/Ampl]
Insert Line
Delete Line
Clear
Previous
Scan/Debug Mode
Trigger
Free Run
External
Trig Slop [Pos/Neg]

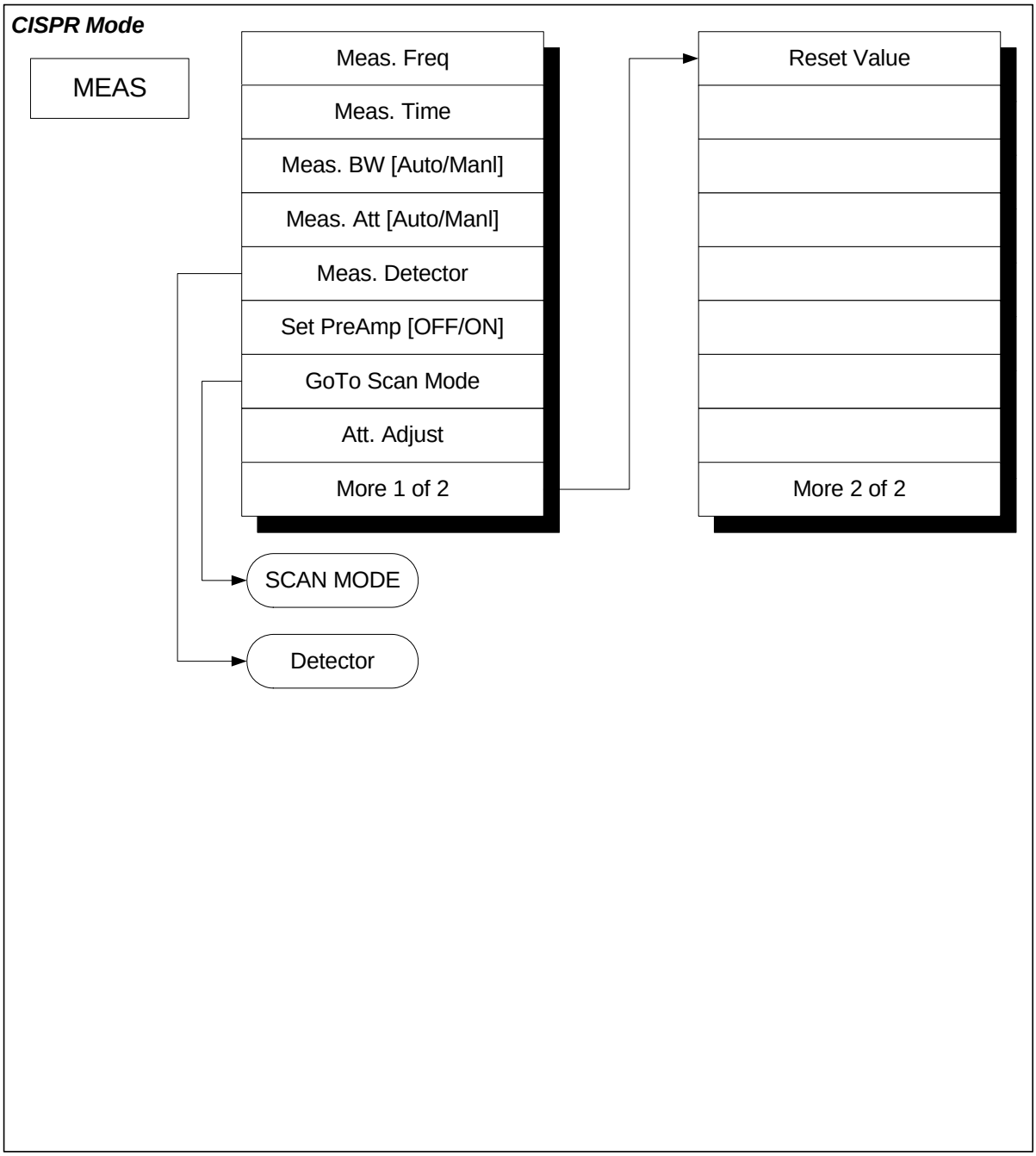
Panel Key	Soft Menu 1	Soft Menu 2



Panel Key	Soft Menu 1	Soft Menu 2

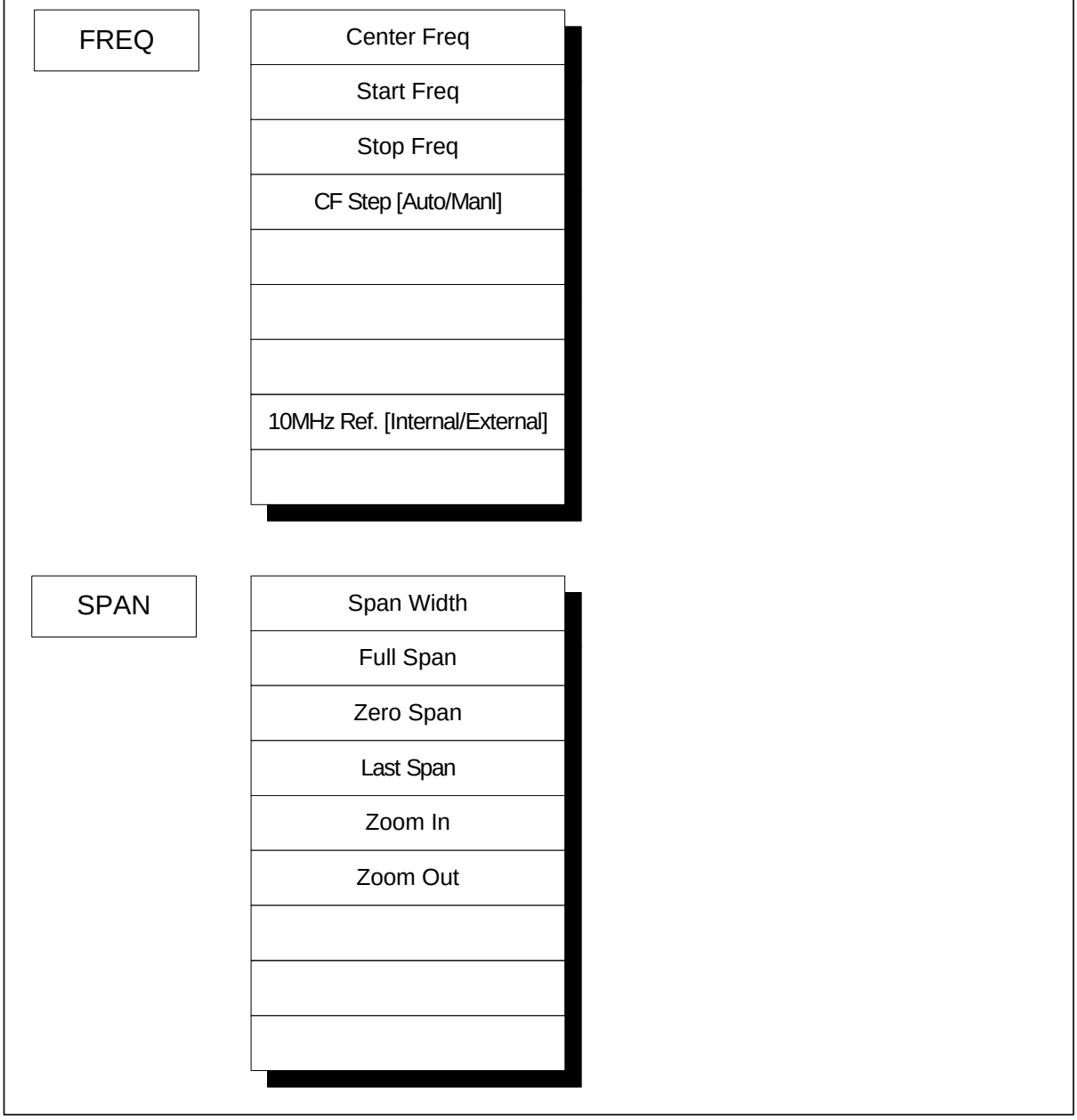


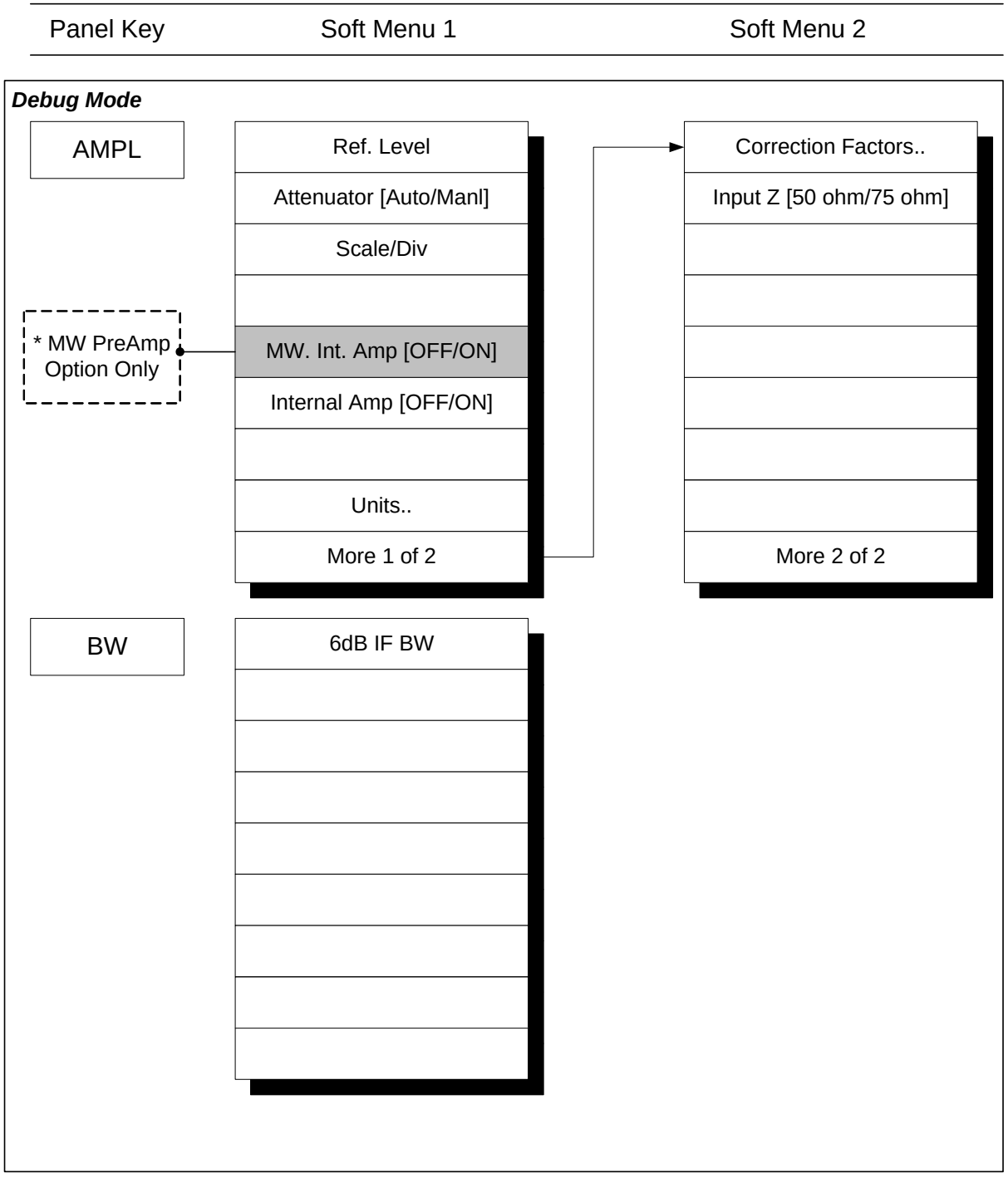
Panel Key	Soft Menu 1	Soft Menu 2



Panel Key	Soft Menu 1	Soft Menu 2

Debug Mode





***Note**: other keys have the same functions as in Spectrum mode. For any keys not mentioned above, please refer to the Operating Manual.*

Chapter 3
MENU DESCRIPTION

Contents

Control using keyboard and mouse

Keyboard

You can control the equipment with an externally connected keyboard by selecting [System], *[More 1 of 2]*, *[Keyboard (Keypad)]*.

Keys on the keyboard then correspond to the instrument as below:

Keyboard	Instrument
F1–F9	Soft keys (F1–F8) and NEXT (F9) key
0–9 / - / **.** (period) / ← (backspace)	Number keys on the keypad and hard keys
Left/right cursor keys (← →)	Scroll knob
Up/down cursor keys (↑↓)	Step key
A–Z	Hard keys (refer to the table below)

Table 3-1 Hard key equivalents on external keyboard

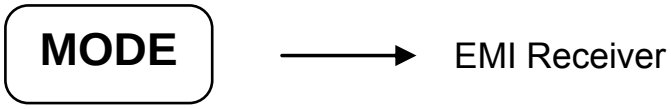
Hard key	Keyboard	Hard key	Keyboard	Hard key	Keyboard
FREQ	FR	DISPLAY	DI	BW	BW
SPAN	SP	TRACE	TRA	AUX	AU
AMPL	AM	Trig	TRI	SOURCE	SO
MEAS	ME	LIMIT	LI	SWEEP	SW
CONTROL	CON	COUPLE	COU	SYSTEM	SY
Preset	PRE	FUNC	FU	Start	ST
File	FI	Save	SA	Print	PRI
MARKER	MA	Single	SI	PEAK	PE
MKR >	MK				

Mouse

Soft-key operation can be simulated using a mouse. If the mouse has a wheel, wheel operation corresponds to the instrument's scroll knob.

Selecting EMI receiver mode

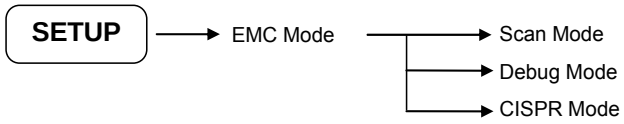
You need to switch the instrument to EMI Receiver mode to use its EMI measurement capability.



Select the [MODE] hard key on the front panel of the signal analyzer, and then press the *[EMI Receiver]* soft key. If the *[EMI Receiver]* key is inactive, the EMI Receiver option is not installed on the current system: contact your sales office.

Selecting EMC measurement mode

EMC measurement mode is divided into Scan, CISPR and Debug Mode. When you enter EMC Mode, the initial state is Scan Mode. Change the measurement mode as follows:



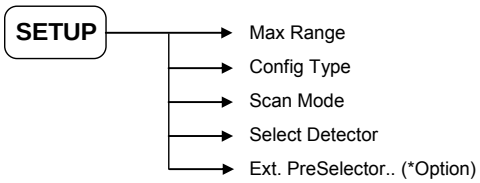
Scan Mode	Measurement ranges divide into multiple ranges. A range is set for each scan based on the contents of the preceding scan.
Debug Mode	Only Peak detection mode is usable, and you can repeatedly sweep the frequency range.
CISPR Mode	You set a specific frequency, followed by continuous scans.

Scan mode

Entire set

Use this to set up all the ranges.

Setup menu



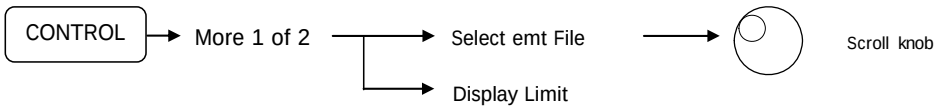
Max Range	Sets the number of ranges (from one to six).
Config Type	Selects Default, which uses the system settings, or Manl, which lets you set the values.
Scan Mode	Designates the X axis as a linear or log scale.
Select Detector	Positive, Average, Quasi-peak, Log Average, RMS Average and CISPR Average detection modes can be set ON or OFF.
PreSelector..	Choose whether to use the optional preselector.

***Note**: you can choose one out of the three detectors: Quasi-Peak, Log Average, and CISPR Average.*

You can choose one detector between Average and RMS Average.

Select emt file/display limit

Limit lines allow you to test trace data against limits that you have set.



Press *[Select emt file]* and select the desired limit file using the scroll knob. Press *[Display Limit]* to display the limit lines for the desired detector on the screen.

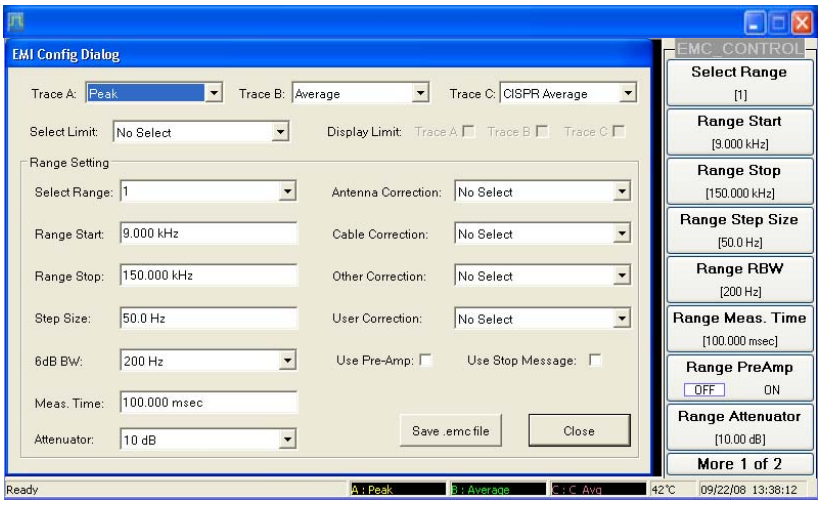
See the 'Limit line function' section in the 3250 Series Operating Manual for details on how to generate correction data files.

***Note**: you can create or modify limit factors using a text editor, for example WordPad in Windows XP. Each limit file has a maximum of 8192 points available.*

Set sub-range

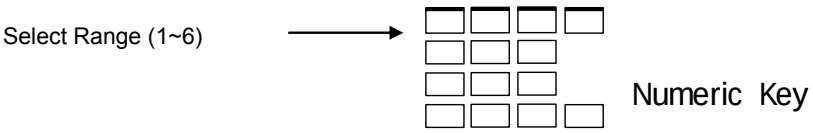
Each measurement range has a sub-range of settings that can be set up differently for each range.

To set the sub-range, press [CONTROL] and display the EMI Config Dialog window.



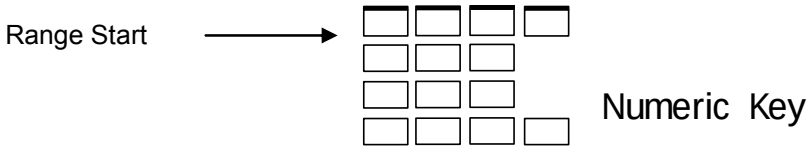
Select Range

Select the range you want to change:



Range Start

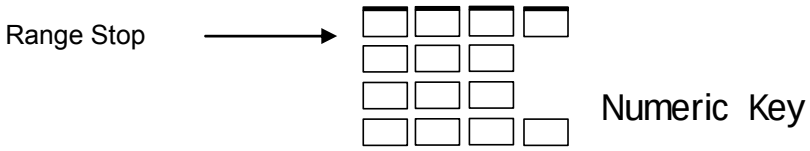
Choose the start frequency for this range.



In EMC mode, available frequencies are 9 kHz–3 GHz/8 GHz/13.2 GHz/26.5 GHz.

Range Stop

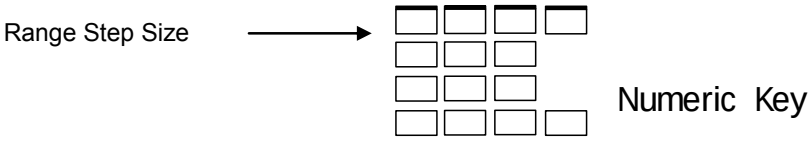
Choose the stop frequency for this range.



In EMI measurement mode, the available frequencies are 9k Hz–3 GHz/13.2 GHz/26.5 GHz.

***Note**: when setting up a range, we recommended setting boundaries to 1 GHz.*

Range Step Size



The step frequency has limits from 1 Hz to the maximum frequency range (Stop Freq - Start Freq).

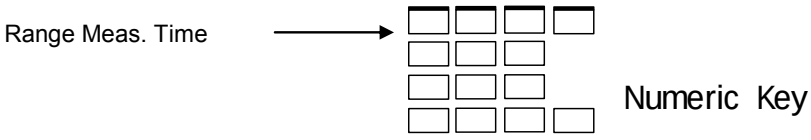
Range RBW

This lets you set the RBW filter (6 dB IF BW).

The IF filter is selectable, and depending on the mode, it detects different frequencies:

- QP Detector : 200 Hz, 9 kHz, 120 kHz (three frequencies)
- Log Detector: 1 MHz, Impulse (1M) (two frequencies)
- Peak, Average, RMS Average, CISPR Average Detect: 10 Hz, 100 Hz, 200 Hz, 1 kHz, 9 kHz, 10 kHz, 100 kHz, 120 kHz, 1 MHz, Impulse (1M) (10 frequencies)

Range Meas. time



Constraints on the measurement time are shown in the following table.

	Band A	**Band B**	**Band C/D**
Frequency	9 kHz–150 kHz	150 kHz–30 MHz	30 MHz–1 GHz
6dB IF BW	200 Hz	9 kHz	120 kHz
Meas. Time (QP Detect)	1 s–100 s	1 s–100 s	1 s–100 s
Meas. Time (Peak, Average)	2.5 ms–100 s	1 ms–100 s	1 ms–100 s

Range Pre-Amp

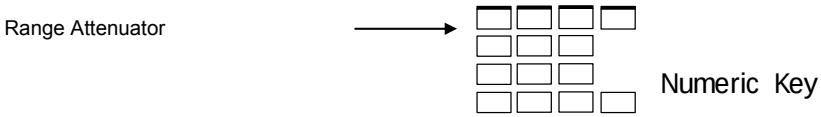
The signal analyzer has a built-in pre-amp that is usable from 1 MHz to 3 GHz. You can select whether to use the pre-amp.

Range PreAmp [OFF/ON]

***Note**: if the MW PreAmp option is fitted, the MW pre-amp works above 1 GHz.*

Range Attenuator

If the input signal is higher than the limit, the signal analyzer could be damaged. To attenuate the external signal, use the following key.

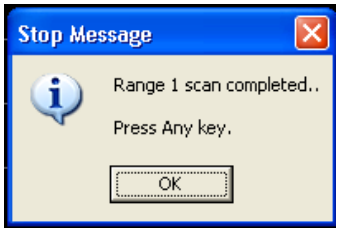


If you select Auto, the attenuator adjusts itself according to the external signal while scanning.

Use Stop Message

If you enable this, a stop message appears when the sub-range scan is complete.

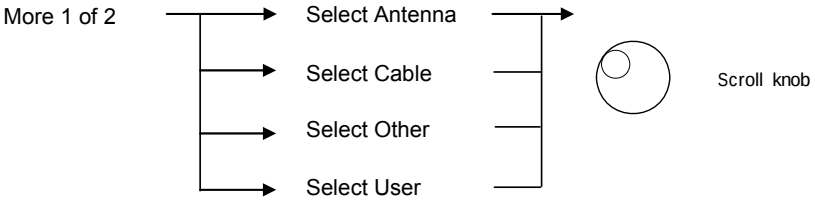
More 1 of 2 → Use Stop Message [OFF/ON]



Sub-range correction data

Four types of correction factor (Antenna, Cable, Other, User) are available in each sub-range.

Use these keys to apply each correction factor.

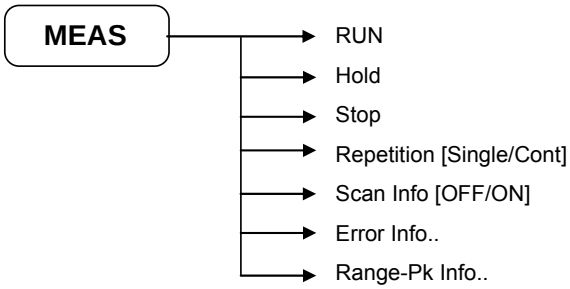


***Note**: refer to the 3250 Series Operating Manual 46892/974, 'Setting amplitude correction', for details on how to generate correction data files.*

***Note**: you can create or modify correction factors using a text editor, for example WordPad. Each correction file has a maximum of 8192 points available, and you can save a maximum of 1000000 files for each factor.*

Measure menu

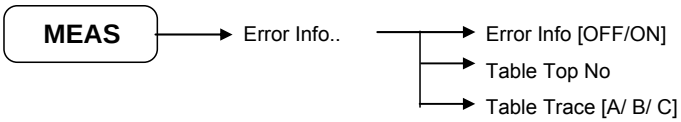
This key controls scan operation.



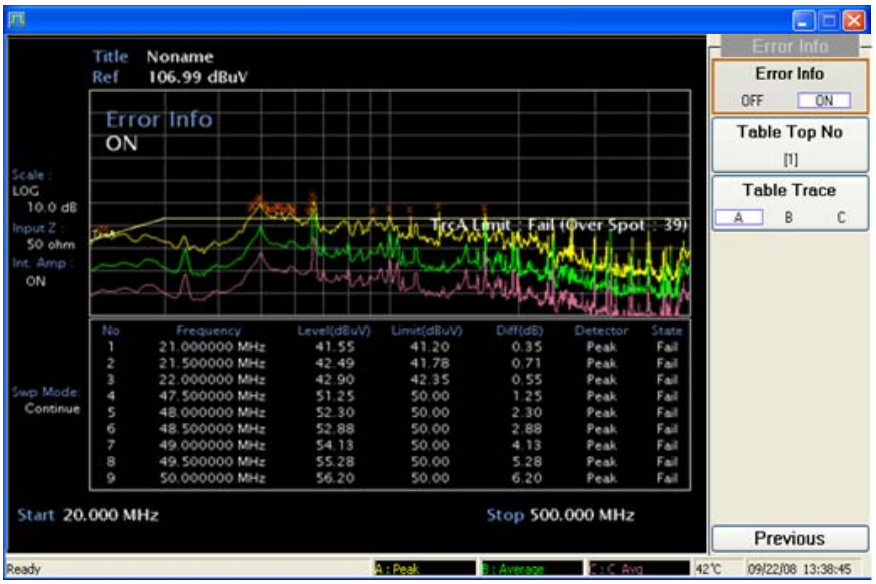
RUN	Scans from start frequency to stop frequency.
Hold	The ongoing action is temporarily held. To resume, press the RUN key.
Stop	Stops the scanning action.
Repetition	Selects whether to repeat the entire range.
Scan Info	Displays information about the current progress of the scan.
Error Info..	Displays information about the number of points that have exceeded the limit line (error points).
Range-Pk Info	Divides up the screen, then displays peak information about each area.

Display error info

This key displays information about errors that occurred during the preceding scan.



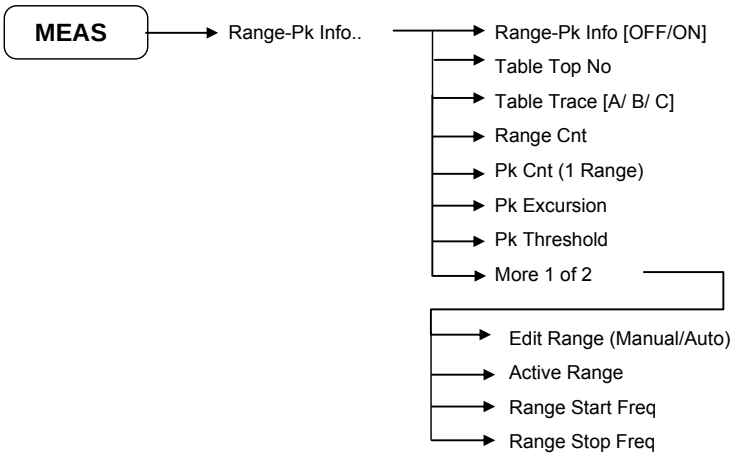
Error Info	Sets whether the error information window displays or not.
Table Top No	The number corresponds to the order in which the error information is displayed.
Table Trace	Selects the trace for which to display error information.



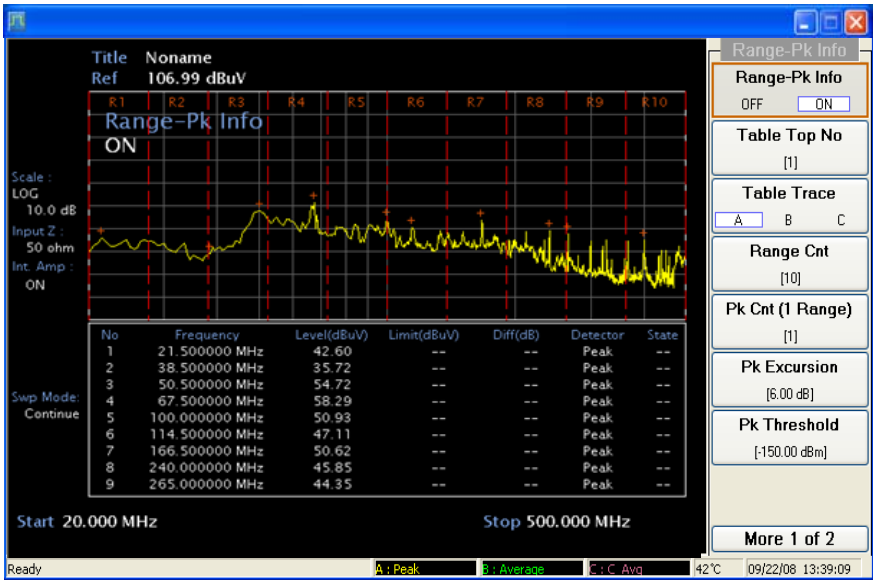
***Note**: points that exceed the limit line are marked with an 'X'.*

Display the peak in a certain area

To find the peak in a certain area, use the following keys.



Range-Pk Info	Displays range-peak information on the screen.
Table Top No	Displays selected point on table.
Table Trace	Selects the trace to display.
Range Cnt	Sets the maximum range number to display.
Pk Cnt	Sets the maximum number of peaks to find in each range.
Pk Excursion	Sets the minimum amplitude variation of signals that the marker can identify as a peak.
Pk Threshold	Sets a lower boundary to the active trace.
Edit Range	Lets you modify the frequency of the range when Manl is selected.
Active Range	Selects any range to modify.
Range Start Freq	Sets the start frequency of the selected range.
Range Stop Freq	Sets the stop frequency of the selected range.

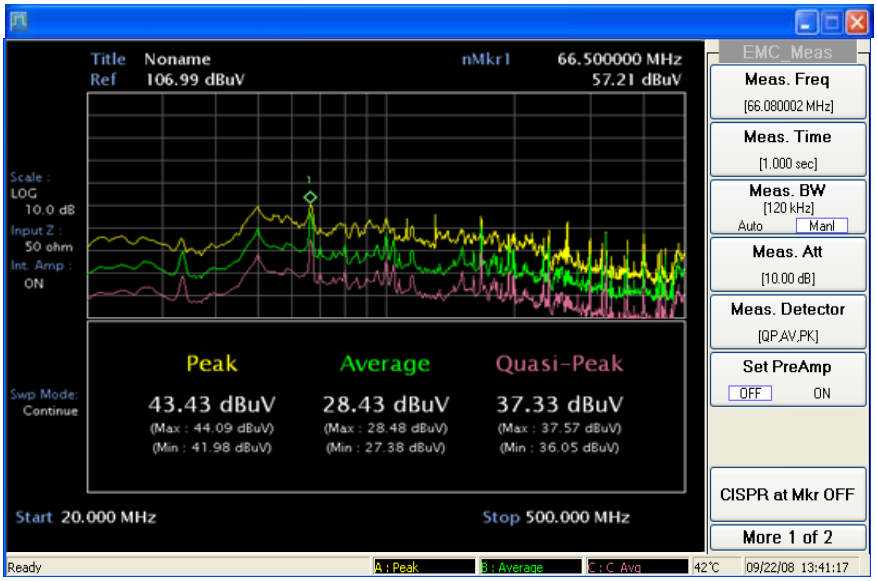


***Note**: peak points appear as '+' in the Range-Pk display mode.*

Point measurement

You can observe specific frequencies after a scan measurement.

1) Stop the scan measurement when the entire scan is complete (press [MEAS], *[Stop]*)
2) Display a marker on the trace and select the point that you want to measure (press [MARKER] or [PEAK])
3) Press *[CISPR at Marker]* to enter the point measurement.
4) The results for each detector display in the lower part of the trace screen.
5) The CISPR measurement menu appears in the soft-key area.
6) Press *[CISPR at Mkr OFF]* to stop the measurement.

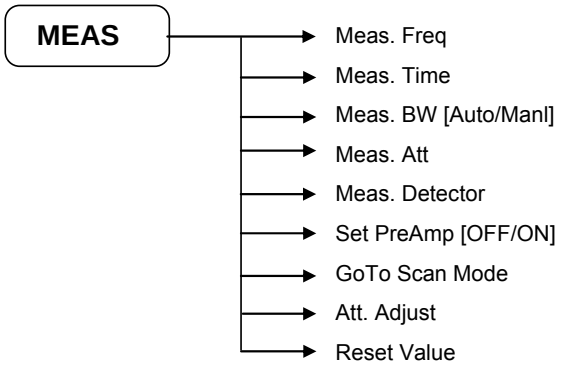


CISPR mode

In CISPR mode, frequencies for continuous measurement are displayed on the screen. This mode lets you use specific frequencies of the signal to observe changes.

Control menu

Use the following to measure in CISPR mode.



Meas. Freq	Sets the frequency to measure.
Meas. Time	Sets the measure time for each point. For QP detection, if you want to make accurate measurements, this needs to above 1 s.
Meas. BW	Selects the 6 dB filter to measure.
Meas. Att	Selects the attenuator to measure.
Meas. Detector	Selects the signal detector.
Set PreAmp	Selects whether to use the pre-amp.
	The operational range of the pre-amp is 1 MHz–3 GHz. For the MW preamp (optional), it is 1 GHz–26.5 GHz.
GoTo Scan Mode	Stops the measurement and goes to Scan mode.
Reset Value	Resets Max/Min level to the current level.
Att. Adjust	Adjusts the attenuator according to the current input signal.

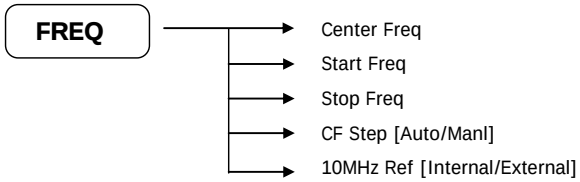
***Note**: if you select Auto for Meas. BW, it changes in accordance with Meas. Freq.*

Debug mode

Debug mode is similar in behavior to Spectrum mode. It helps you to investigate the peak portion of the signal quickly.

Frequency menu

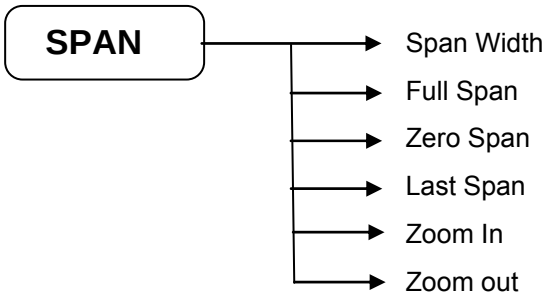
The frequency-setting menu is displayed.



Center Frequency	Sets the center frequency.
Start Frequency	Sets the start frequency.
Stop Frequency	Sets the stop frequency.
CF Step	Sets the interval by which the center frequency moves when it changes.
10MHz Ref [Internal/External]	Sets the path for the 10 MHz reference signal.

Span menu

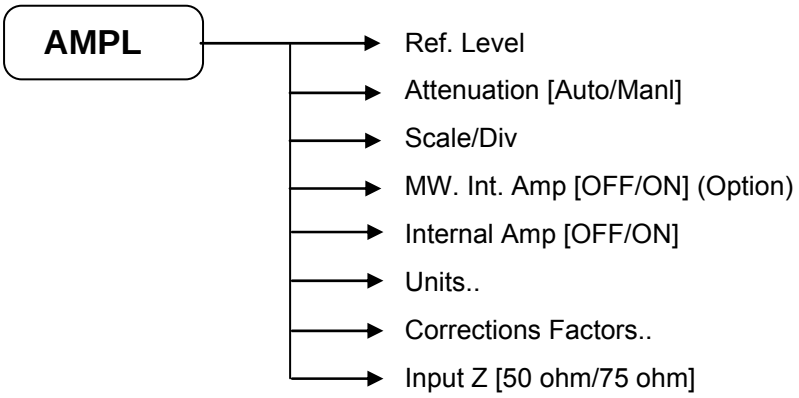
The frequency span setting menu is displayed.



Span Width	Sets the span width.
Full Span	Sets the maximum span.
Zero Span	Sets the zero span.
Last Span	Goes back to the previous span.
Zoom In	Decreases the current span by 0.5.
Zoom Out	Decreases the current span by 2.

Amplitude menu

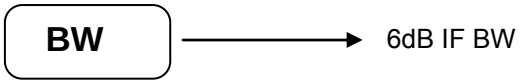
The amplitude setting menu is displayed.



Ref. Level	Sets the reference level.
Attenuation	Sets the attenuation level, according to the input signal.
Scale/Div	Sets the grid spacing of the y-axis.
MW. Int. Amp	Sets the MW preamp (MW PreAmp option).
Internal Amp	Sets the internal amplifier.
Units..	Changes the units of the reference level.
Corrections Factors..	Sets the correction value for antenna, cable, user or other.
Input Z	Sets the input impedance. For 75 ohm, connect an external pad.

BW

The IF 6 dB bandwidth, which sets the RBW.



6dB IF BW	Set RBW value. Select from 10/ 100/ 200/ 1k/ 9k/ 10k/ 100k/ 120k/ 1MHz/ Impulse.

Limitations

The following keys are not available in Scan mode:

[SPAN[, [TRACE], [COUPLE], [BW], [AUX], [Tune], [MKR >], [FUNC].

The following keys are not available in CISPR mode:

[FREQ], [SPAN[, [DISPLAY], [TRACE], [LIMIT], [TRIG], [COUPLE], [BW], [AUX], [Tune], [SWEEP], [Single], [MARKER], [PEAK], [MKR >], [FUNC].

The following keys are not available in Debug mode:

[MEAS], [CONTROL], [TRACE], [LIMIT], [COUPLE], [AUX], [Tune], [MKR >], [FUNC].

Chapter 4
MAKING EMI MEASUREMENTS

Contents

EMI measurements

EMC measurement capability consists of the following three modes:

- Scan mode
- Debug mode
- CISPR authentication mode

SCAN mode

This is the main EMC measurement mode. You can measure the signal from start frequency to stop frequency in variable frequency steps by setting this in the EMI Config Dialog table. You can set frequency steps to a linear or log scale, and set up parameters such as detector, range number, range parameter, limit table and correction table in the EMI Config EMC table, which can be saved by **.emc* type.

The instrument can measure three types of detector (positive, average, quasi-peak) simultaneously, and display results on the screen. Trace A is positive, Trace B is average or RMS average, and Trace C is quasi peak, log average, or CISPR average detector. You can set up a limit line for each detector and compare three lines at once.

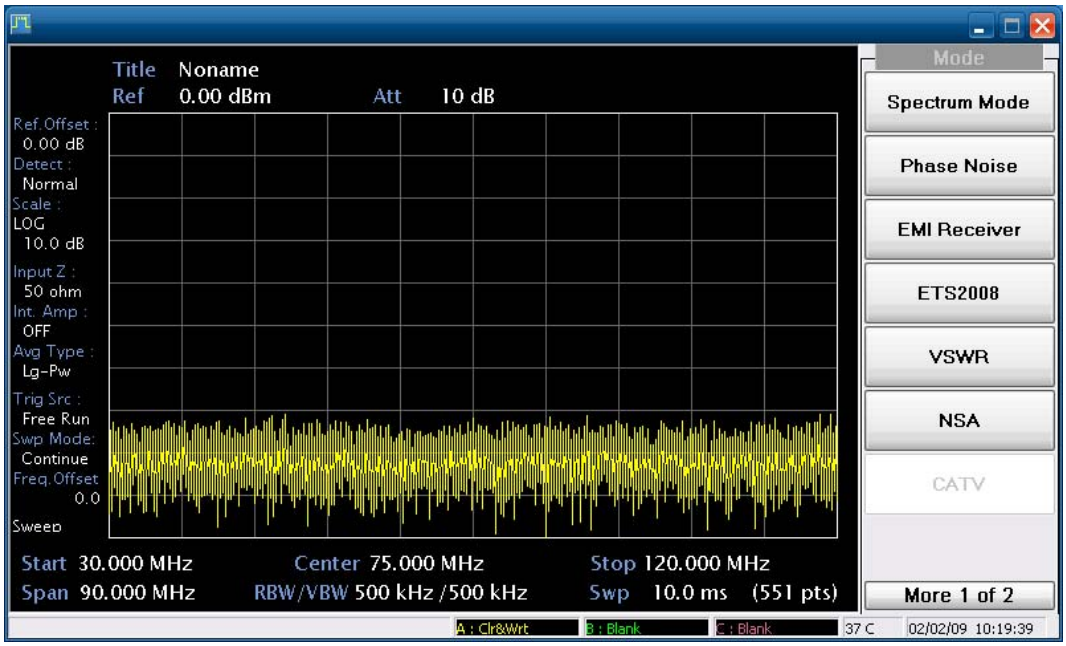
***Note**: EMI measurement files must be located in the E:\UserData folder.*

Scan measurement methods (example)

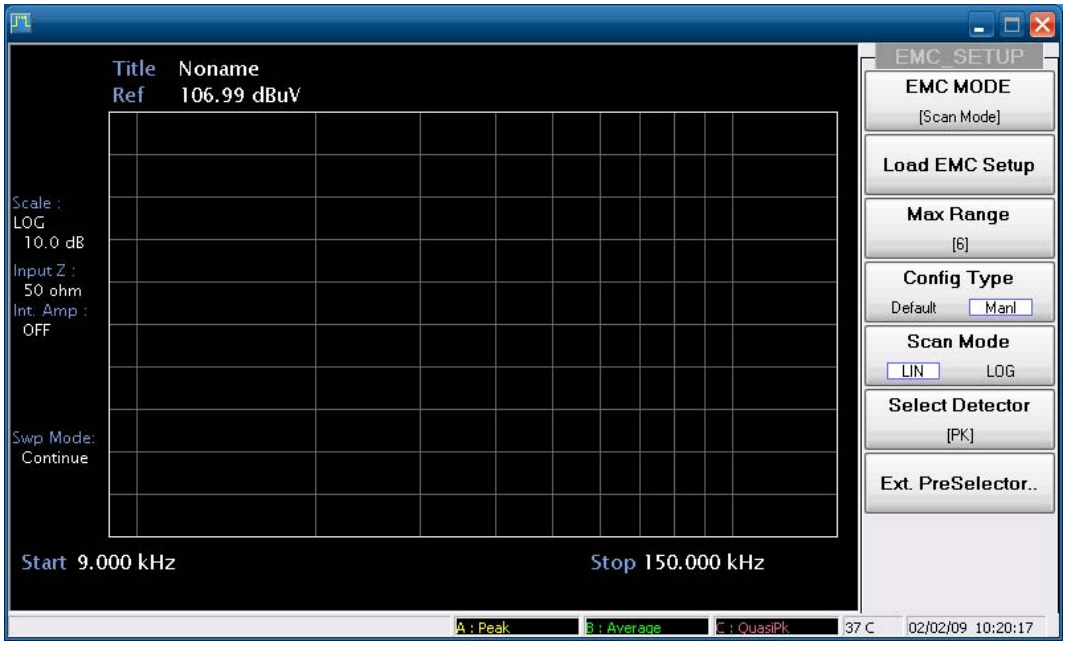
This explains how to make scan mode measurements, with examples.

Note: when you turn on the EMI Receiver features, Scan mode is the default state.

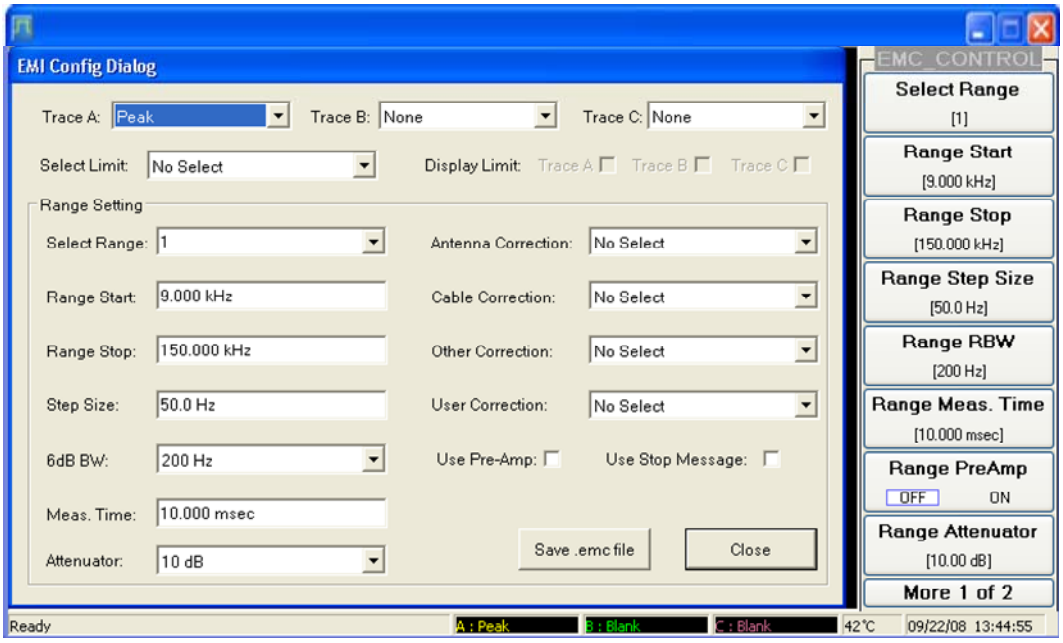
1 Press the [MODE] key, and select EMI Receiver mode by pressing the *[EMI Receiver]* key.



2 To enter EMC mode, press the [SETUP] key to display the EMC setup menu.

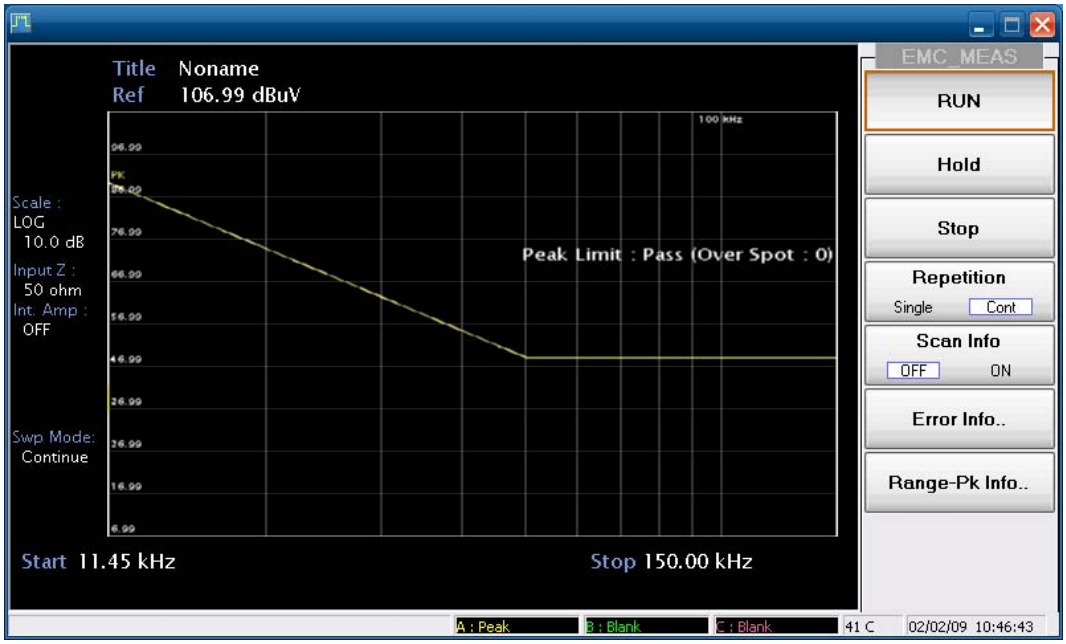


3 Set sub-ranges in the EMI Config screen. To adjust the settings in detail, press the **[**CONTROL**]** key. To use limit functions, use the limit files in the limit table feature.

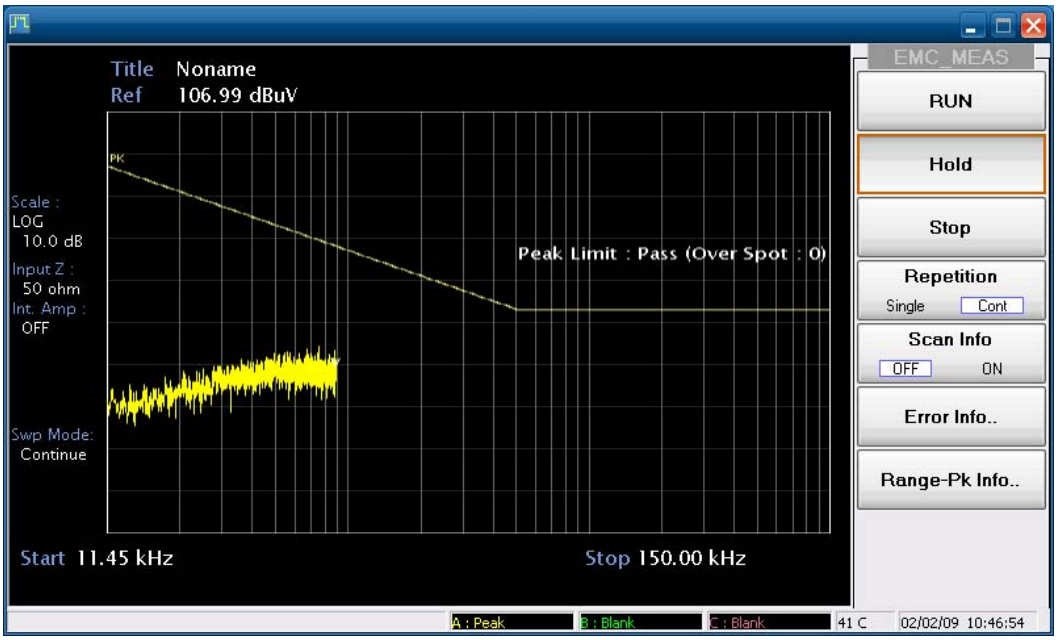


4 Set the actual start and stop frequencies after pressing [FREQ]. To display the measurement menu, press [MEASURE]. Start the scan by pressing *[RUN]*.

***Note**: the start and stop frequency represent the start and stop of the entire range.*

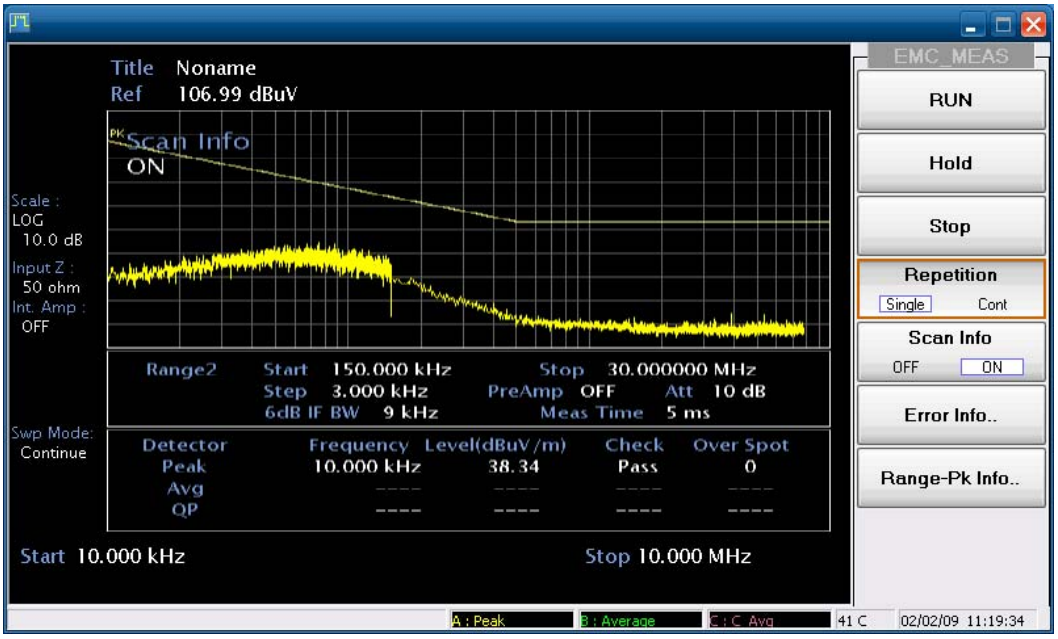


The display shows how the measurement is progressing. If you want to pause the measurement, press *[Hold]*.

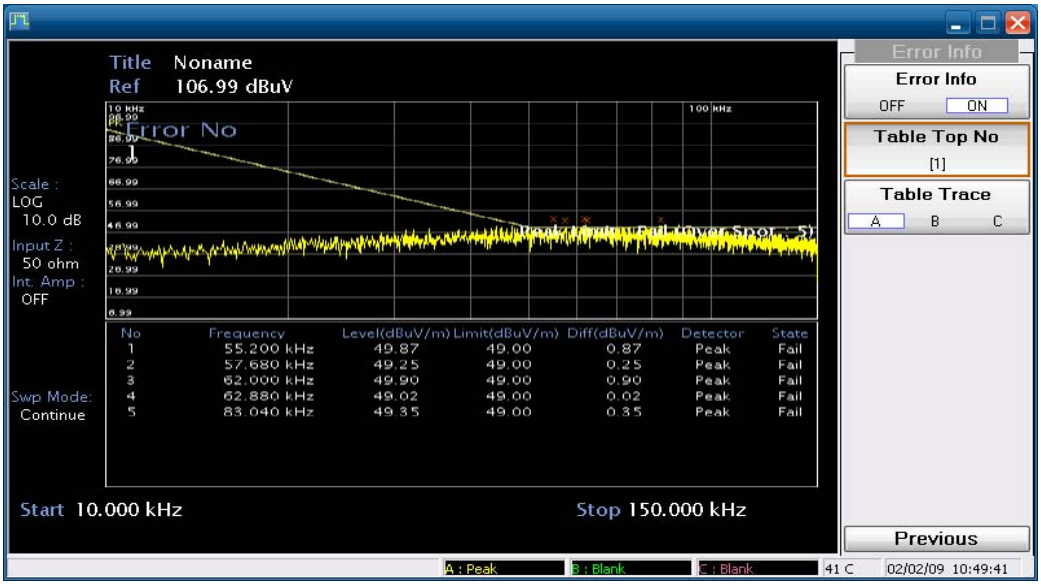


Press *[RUN]* again to restart the scan measurement.

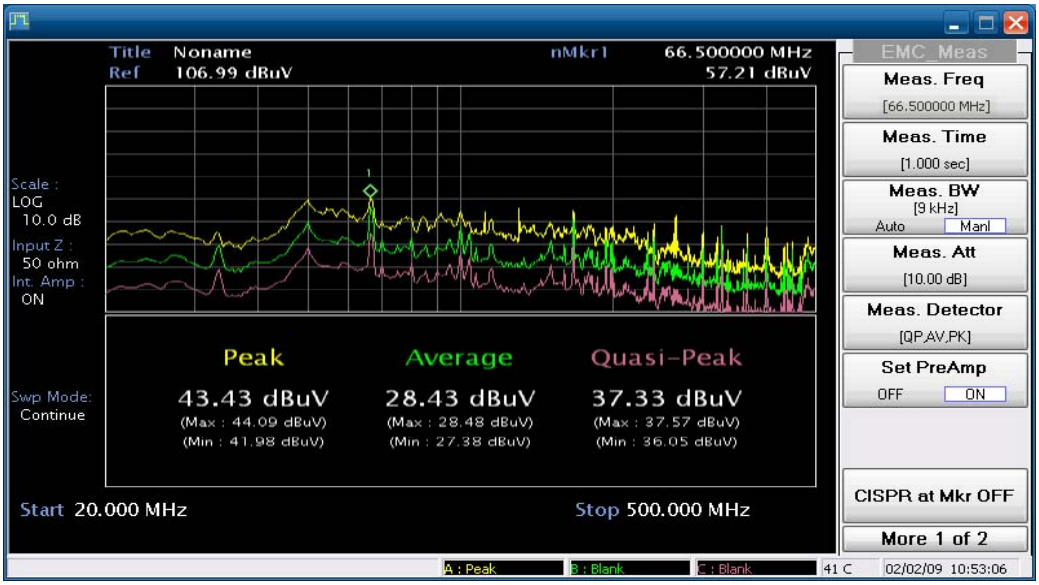
Press *[Scan Info]* to get information about the progress.



5 Depending on the selected output detection mode, the chosen signal is displayed on the screen. Points where the signal exceeds the limit are highlighted. For more information on the display error, press the *[Error Info]* key.



6 When the scan is complete, you can observe certain frequencies using single-point measurement. Press [MARKER] or [PEAK] key to display a marker. Move the activated marker to any point. To measure, press *[CISPR at Mkr]*.

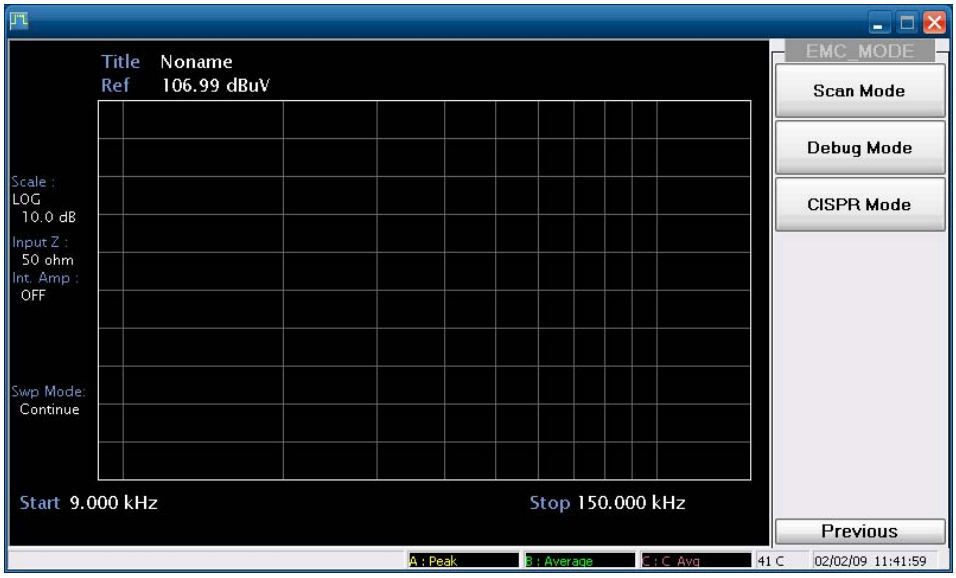


7 Press *[CISPR at Mkr OFF]* when you want to stop the measurement.

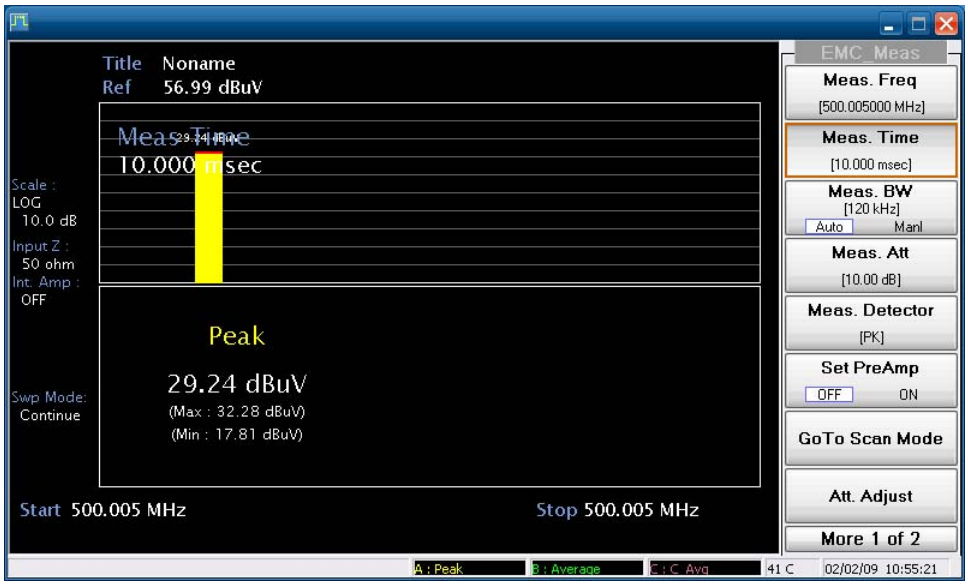
CISPR measurement method (example)

This example describes how to detect a certain frequency of the signal analyzer using Peak, Average, and Quasi-peak values.

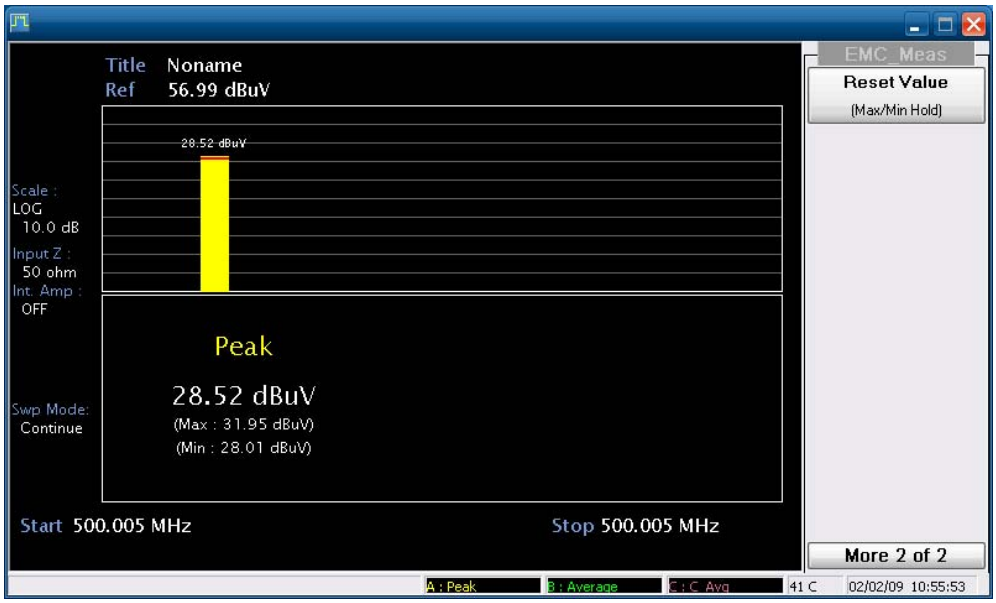
1 Press the [MODE] key and enter CISPR measurement mode by pressing the *[CISPR Mode]* key.



2 Select the measuring frequency, measuring BW filter, preamp and attenuator. In order to change the detection mode, press *[Meas. Detector]*. Turn on each detector that you want.



3 The results table displays maximum and minimum values since the start of measurement. If you press *[More 1 of 2]*, *[Reset Value]*, the table is reset to the current value.



4 CISPR measurement stops when the measurement mode changes.

***Note**: setting [Meas. ATT] to Auto adjusts attenuation according to the input signal.*

If you set [Meas. BW] to Auto, the BW filter changes according to what you set in [Meas. Freq].

EMC debug measurement

Debug mode is similar in behavior to Spectrum mode. It helps you to investigate the peak portion of the signal quickly.

For more information, refer to the 3250 Series Operating Manual 46892/974.

***Note**: for EMI measurement, use a 6 dB filter in Spectrum mode.*

Chapter 5
DETAILED DESCRIPTION OF COMMANDS

Contents

General description

This section gives detailed descriptions of the device messages for the spectrum analyzer, in order of function. The following example shows the command format.

Note that 'Δ' = 'blank' throughout this document.

SA command

SCPI command

	Command Name
Function	The explanation of the command.
Remote Command	SA CommandΔsw
	SA CommandΔf
	SA Command?
	SCPI CommandΔsw
	SCPI CommandΔf
	SCPI Command?
Response Message	sw or f
	(Depending on command)
Value of f	Range of sw or f
	(Depending on command)
Suffix code	Unit of f
	(Depending on command)
Initial setting	Initial value for SA System
Example	SA Command sw;
	SA Command f;
	SA Command?;
	SCPI Command sw;
	SCPI Command f;
	SCPI Command?;

Amplitude

RL

:DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel

	Reference Level	
Function	Sets the reference level value.	
Remote Command	RLΔf	
	RL?	
	:DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVelΔf	
	:DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel?	
Response Message	Reference Level (dBm)	
Value of f	-170 dBm to 30 dBm (Step: 0.01dBm)	
Suffix code	None	: dBm
	DBM	: dBm
	DBUV	: dBuV
	DBUA	: dBuA
	DBUVM	: dBuV/m
	DBUAM	: dBuA/m
	DBMV	: dBmV
	DBMA	: dBmA
	DBPW	: dBpW
	DBPT	: dBpT
	V	: V
	MV	: mV (10^-3 V)
	UV	: uV (10^-6 V)
	NV	: nV (10^-9 V)
	W	: W
	MW	: mW (10^-3 W)
	UW	: uW (10^-6 W)
	NW	: nW (10^-9 W)
	A	: A
	MA	: mA (10^-3 A)
	UA	: uA (10^-6 A)
	NA	: nA (10^-9 A)
Initial setting	0 dBuV	
Example	RL 10;	
	RL 30 DBM;	
	RL ?;	
	DISP:WIND:TRAC:Y:RLEV 10;	
	DISP:WIND:TRAC:Y:RLEV 30 DBM;	
	DISP:WIND:TRAC:Y:RLEV?;	

AT

[:SENSe]:POWer[:RF]:ATTenuation

	Attenuation (Debug/CISPR mode only)
Function	Sets the amount of attenuation for the input attenuator.
Remote Command	AT△f
	AT?
	[:SENSe]:POWer[:RF]:ATTenuation△f
	[:SENSe]:POWer[:RF]:ATTenuation?
Response Message	the amount of attenuation (dB)
Value of f	0dB to 55 dB (Step: 5dB)
Suffix code	None : dB
	DB : dB
Initial setting	10 dB
Example	AT 10;
	AT 10DB;
	AT?;
	POW:ATT 10;
	POW:ATT 10DB;
	POW:ATT?;

ATA

[:SENSe]:POWer[:RF]:ATTenuation:AUTO

	Attenuation Auto (Debug mode only)	
Function	Sets input attenuation mode to auto or manual. If auto mode is selected, the amount of attenuation is adjusted automatically. If manual mode is selected, this affects Reference Level.	
Remote Command	ATA△n	
	ATA△sw	
	ATA?	
	[:SENSe]:POWer[:RF]:ATTenuation:AUTO△n	
	[:SENSe]:POWer[:RF]:ATTenuation:AUTO△sw	
	[:SENSe]:POWer[:RF]:ATTenuation:AUTO?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	1	
Example	ATA 1;	
	ATA ON;	
	ATA?;	
	POW:ATT:AUTO 1;	
	POW:ATT:AUTO ON;	
	POW:ATT:AUTO?;	

SD

:DISPlay:LPLot:WINDow:TRACe:Y[:SCALe]:PDIVision

Scale/Divide

Function	Sets the scale/divide value.
Remote Command	SD△f SD? :DISPlay:LPLot:WINDow:TRACe:Y[:SCALe]:PDIVision△f :DISPlay:LPLot:WINDow:TRACe:Y[:SCALe]:PDIVision?
Response Message	Scale/Divide (dB/div)
Value of f	0.1d B to 1 dB (step: 0.1 dB) 1 dB to 20 dB (step: 1 dB)
Suffix code	None : dB/div DB : dB/div
Initial setting	10 dB/div
Example	SD 5; SD 10DB; SD?; DISP:LPL:WIND:TRAC:Y:PDIV 5; DISP:LPL:WIND:TRAC:Y:PDIV 10DB; DISP:LPL:WIND:TRAC:Y:PDIV?;

AU

:UNIT:POWer

	Amplitude Units	
Function	Sets the absolute amplitude units for the input signal display.	
Remote Command	AU△sw	
	AU?	
	:UNIT:POWer△sw	
	:UNIT:POWer?	
Response Message	DBM	: dBm
	DBMV	: dBmV
	DBUV	: dBuV
	DBMA	: dBmA
	DBUA	: dBuA
	V	: V
	W	: W
	A	: A
Value of sw	None	: dBm
	DBM	: dBm
	DBMV	: dBmV
	DBUV	: dBuV
	DBMA	: dBmA
	DBUA	: dBuA
	V	: V
	W	: W
	A	: A
Initial setting	DBM	
Example	AU DBM;	
	AU?	
	UNIT:POW DBM;	
	UNIT:POW?;	

IA

[:SENSe]:POWer[:RF]:GAIN[:STATe]

	Internal Amplifier (Debug/CIISPR mode only)	
Function	Activates the internal amplifier.	
Remote Command	IA△n	
	IA△sw	
	IA?	
	[:SENSe]:POWer[:RF]:GAIN[:STATe]△n	
	[:SENSe]:POWer[:RF]:GAIN[:STATe]△sw	
	[:SENSe]:POWer[:RF]:GAIN[:STATe]?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	IA 1;	
	IA ON;	
	IA?;	
	POW:GAIN 1;	
	POW:GAIN ON;	
	POW:GAIN?;	

IA2

MW-LNA

	Option, Debug/CIISPR mode only	
Function	Activates the internal amplifier (MW-LNA).	
Remote Command	IA△n	
	IA△sw	
	IA?	
	[:SENSe]:POWer[:RF]:GAIN[:STATe]△n	
	[:SENSe]:POWer[:RF]:GAIN[:STATe]△sw	
	[:SENSe]:POWer[:RF]:GAIN[:STATe]?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	IA 1;	
	IA ON;	
	IA?;	
	POW:GAIN 1;	
	POW:GAIN ON;	
	POW:GAIN?;	

COAS

[:SENSe]:CORRection:CSET:ALL[:STATe]

	All correction states (Debug mode only)	
Function	Sets all correction states (1: Antenna, 2: Cable, 3: Other, 4: User) ON or OFF.	
Remote Command	COAS△n	
	COAS△sw	
	COAS?	
	[:SENSe]:CORRection:CSET:ALL[:STATe]△n	
	[:SENSe]:CORRection:CSET:ALL[:STATe]△sw	
	[:SENSe]:CORRection:CSET:ALL[:STATe]?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	COAS 1;	
	COAS ON;	
	COAS?;	
	CORR:CSET:ALL 1;	
	CORR:CSET:ALL ON;	
	CORR:CSET:ALL?;	

COA1|2|3|4

[:SENSe]:CORRection:CSET1|2|3|4[:STATe]

	Correction state (Debug mode only)	
Function	Sets correction state ON or OFF (1: Antenna, 2: Cable, 3: Other, 4: User)	
Remote Command	COA1|2|3|4△n	
	COA1|2|3|4sw	
	COA1|2|3|4?	
	[:SENSe]:CORRection:CSET1|2|3|4[:STATe]△n	
	[:SENSe]:CORRection:CSET1|2|3|4[:STATe]△sw	
	[:SENSe]:CORRection:CSET1|2|3|4[:STATe]?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	COA1 1;	
	COA2 ON;	
	COA3?;	
	CORR:CSET1 1;	
	CORR:CSET2 ON;	
	CORR:CSET3?;	

COAD

[:SENSe]:CORRection:CSET:ALL:DELete

All Corrections OFF (Debug mode only)

Function	Sets all correction states and data to OFF.
Remote Command	COAD
	[:SENSe]:CORRection:CSET:ALL:DELete?
Example	COAD;
	CORR:CSET:ALL:DEL;

Bandwidth

RB

[:SENSe]:BANDwidth|BWIDth[:RESolution]

	Resolution bandwidth (Debug/CISPR mode only)
Function	Sets the RBW value.
Remote Command	RB△f
	RB?
	[:SENSe]:BANDwidth|BWIDth[:RESolution]△f
	[:SENSe]:BANDwidth|BWIDth[:RESolution]?
Response Message	Resolution Bandwidth (Hz)
Value of f	IMPULSE, 1 MHz, 120 kHz, 100 kHz, 10 kHz, 9 kHz, 1 kHz, 200 Hz, 100 Hz, 10 Hz
Suffix code f	None : Hz (10^0)
HZ	: Hz (10^0)
KHZ	: kHz (10^3)
MHZ	: MHz(10^6)
GHZ	: GHz (10^9)
Initial setting	1 MHz
Example	RB IMPULSE;
	RB 1MHZ;
	RB?
	BAND IMPULSE;
	BAND 1MHZ;
	BAND?;

Display

FSCR

:DISPlay:FSCReen[:STATe]

	Full screen (Debug mode only)	
Function	Sets full screen mode.	
Remote Command	FSCR△n	
	FSCR△sw	
	FSCR?	
	:DISPlay:FSCReen[:STATe]△n	
	:DISPlay:FSCReen[:STATe]△sw	
	:DISPlay:FSCReen[:STATe]?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	1	
Example	FSCR 1;	
	FSCR ON;	
	FSCR?	
	DISP:FSCR 1;	
	DISP:FSCR ON;	
	DISP:FSCR?;	

DL

:DISPlay:WINDow:TRACe:Y:DLINe

Display line amplitude (Debug mode only)

Function	Sets the amplitude of the display line.	
Remote Command	DL△f	
	DL?	
	:DISPlay:WINDow:TRACe:Y:DLINe△f	
	:DISPlay:WINDow:TRACe:Y:DLINe?	
Response Message	Amplitude of Display Line	
Value of f	Reference Level to (Reference Level-10*Scale/DIV) (step: 0.01 dBm)	
Suffix code	None	: dBm
	DBM	: dBm
	DBMV	: dBmV
	DBUV	: dBuV
	DBMA	: dBmA
	DBUA	: dBuA
	V	: V
	MV	: mV (10^-3 V)
	UV	: uV (10^-6 V)
	NV	: nV (10^-9 V)
	PV	: pV (10^-12 V)
	W	: W
	MW	: mW (10^-3 W)
	UW	: uW (10^-6 W)
	NW	: nW (10^-9 W)
	PW	: pW (10^-12 W)
	FW	: fW (10^-15 W)
	A	: A
	MA	: mA (10^-3 A)
	UA	: uA (10^-6 A)
	NA	: nA (10^-9 A)
	PA	: pA (10^-12 A)
Initial setting	Reference Level	
Example	DL 0;	
	DL –50DBM;	
	DL?;	
	DISP:WIND:TRAC:Y:DLIN 0;	
	DISP:WIND:TRAC:Y:DLIN –50DBM;	
	DISP:WIND:TRAC:Y:DLIN?;	

DLS

:DISPlay:WINDow:TRACe:Y:DLINe:STATe

	Display Line State (Debug mode only)	
Function	Turns Display Line ON or OFF.	
Remote Command	DLS△n	
	DLS△sw	
	DLS?	
	:DISPlay:WINDow:TRACe:Y:DLINe:STATe△n	
	:DISPlay:WINDow:TRACe:Y:DLINe:STATe△sw	
	:DISPlay:WINDow:TRACe:Y:DLINe:STATe?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	DLS 1;	
	DLS ON;	
	DLS?	
	DISP:WIND:TRAC:Y:DLIN:STAT 1;	
	DISP:WIND:TRAC:Y:DLIN:STAT ON;	
	DISP:WIND:TRAC:Y:DLIN:STAT?;	

TH

:DISPlay:WINDow:TRACe:Y:TLINe

Threshold Line Amplitude (Debug mode only)

Function	Sets the threshold level and ignores data below this value.	
Remote Command	TH△f	
	TH?	
	:DISPlay:WINDow:TRACe:Y:TLINe△f	
	:DISPlay:WINDow:TRACe:Y:TLINe?	
Response Message	Threshold line amplitude	
Value of f	Reference Level to Reference Level-10*Scale/DIV (step: 0.01 dBm)	
Suffix code	None	: dBm
	DBM	: dBm
	DBMV	: dBmV
	DBUV	: dBuV
	DBMA	: dBmA
	DBUA	: dBuA
	V	: V
	MV	: mV (10^-3 V)
	UV	: uV (10^-6 V)
	NV	: nV (10^-9 V)
	PV	: pV (10^-12 V)
	W	: W
	MW	: mW (10^-3 W)
	UW	: uW (10^-6 W)
	NW	: nW (10^-9 W)
	PW	: pW (10^-12 W)
	FW	: fW (10^-15 W)
	A	: A
	MA	: mA (10^-3 A)
	UA	: uA (10^-6 A)
	NA	: nA (10^-9 A)
	PA	: pA (10^-12 A)
Initial setting	Reference Level-10*Scale/Div	
Example	TH 0;	
	TH –50DBM;	
	TH?;	
	DISP:WIND:TRAC:Y:TLIN 0;	
	DISP:WIND:TRAC:Y:TLIN –50DBM;	
	DISP:WIND:TRAC:Y:TLIN?;	

THS

:DISPlay:WINDow:TRACe:Y:TLINe:STATe

	Threshold Line State (Debug mode only)	
Function	Turns Threshold Line ON or OFF.	
Remote Command	THS△n	
	THS△sw	
	THS?	
	:DISPlay:WINDow:TRACe:Y:TLINe:STATe△n	
	:DISPlay:WINDow:TRACe:Y:TLINe:STATe△sw	
	:DISPlay:WINDow:TRACe:Y:TLINe:STATe?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	THS 1;	
	THS ON;	
	THS?	
	DISP:WIND:TRAC:Y:TLIN:STAT 1;	
	DISP:WIND:TRAC:Y:TLIN:STAT ON;	
	DISP:WIND:TRAC:Y:TLIN:STAT?;	

TITLE

:DISPlay:ANNotation:TITLe:DATA

	Screen Title (Debug mode only)
Function	Places the character data on the title area of the display. Available characters are alpha-numeric.
Remote Command	TITLE△text
	TITLE?
	:DISPlay:ANNotation:TITLe:DATA△text
	:DISPlay:ANNotation:TITLe:DATA?
Response Message	Title
Value of text	String
Initial setting	Noname
Example	TITLE SpectrumAnalyzer;
	TITLE?;
	DISP:ANN:TITL:DATA SpectrumAnalyzer;
	DISP:ANN:TITL:DATA?;

GRAT

:DISPlay:WINDow:TRACe:GRATicule:GRID[:STATe]

	Graticule (Scan/Debug mode only)	
Function	Sets the display graticule to Type1 or Type2 or OFF.	
Remote Command	GRAT△sw	
	GRAT?	
	:DISPlay:WINDow:TRACe:GRATicule:GRID[:STATe]△sw	
	:DISPlay:WINDow:TRACe:GRATicule:GRID[:STATe]?	
Response Message	TYPE1	: Type1
	TYPE2	: Type2
	OFF	: OFF
Value of sw	TYPE1	: Type1
	TYPE2	: Type2
	OFF	: OFF
Initial setting	TYPE1	
Example	GRAT TYPE1;	
	GRAT?	
	DISP:WIND:TRAC:Y:GRAT:GRID TYPE1;	
	DISP:WIND:TRAC:Y:GRAT:GRID?;	

WH

:DISPlay:WINDow:WHITe

	White Mode	
Function	Turns white mode ON or OFF.	
Remote Command	WH△n	
	WH△sw	
	WH?	
	:DISPlay:WINDow:WHITe△n	
	:DISPlay:WINDow:WHITe△sw	
	:DISPlay:WINDow:WHITe?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	WH 1;	
	WH ON;	
	WH?	
	DISP:WIND:WHIT 1;	
	DISP:WIND:WHIT ON;	
	DISP:WIND:WHIT?;	

File

FREAD

:MMEMory:CATalog

	File Read
Function	Reads files in selected folder.
Remote Command	FREAD?△‘file_folder’
	:MMEMory:CATalog?△‘file_folder’
Value of file_folder	File Folder
Response Message	File Name,,File Size.
Example	FREAD? ‘C:’;
	FREAD? ‘D:\Temp’;
	MMEM:CAT? ‘C:’;
	MMEM:CAT? ‘D:\Temp’;

FSAVE

:MMEMory:STORe

	File Save	
Function	Saves the file whose type was defined by the extension.	
Remote Command	FSAVE△'file_name'	
	:MMEMory:STORe△'file_name'	
Value of file_name	File Path + File Name	
Supported Extension	bmp	: Bitmap
	jpg	: jpeg
	png	: png
	ant	: Antenna
	cbl	: Cable
	oth	: Other
	usr	: User
	emc	: EMC Config
	emt	: EMC Limit
	sts	: Debug Status
Example	FSAVE 'C:\demo1.emc';	
	FSAVE 'C:\demo2.emt';	
	MMEM:STRO 'C:\demo1.emc';	
	MMEM:STRO 'C:\demo2.emt';	

FLOAD

:MMEMory:LOAD

	File Load	
Function	Loads the selected file.	
Remote Command	FLOAD△‘file_name’	
	:MMEMory:LOAD△‘file_name’	
Value of file_name	File Path + File Name	
Supported Extension	ant	: Antenna
	cbl	: Cable
	oth	: Other
	usr	: User
	emc	: EMC Config
	emt	: EMC Limit
	sts	: Debug Status
Example	FLOAD ‘C:\demo1.emc’;	
	FLOAD ‘C:\demo2.emt’;	
	MMEM:LOAD ‘C:\demo1.emc’;	
	MMEM:LOAD ‘C:\demo2.emt’;	

FDEL

:MMEMory:DELete

	File Delete
Function	Deletes the selected file.
Remote Command	FDEL△‘file_name’
	:MMEMory:DELete△‘file_name’
Value of file_name	File Path + File Name
Example	FDEL ‘C:\demo1.emc’;
	FDEL ‘C:\demo2.emt’;
	MMEM:DEL ‘C:\demo1.emc’;
	MMEM:DEL ‘C:\demo2.emt’;

FCOPY

:MMEMory:COPY

File Copy

Function: Copies the selected file.

Remote Command: FCOPY△'src_file_name', 'dest_file_name'

:MMEMory:COPY△'src_file_name', 'dest_file_name'

Value of src_file_name, dest_file_name

File Path + File Name

Example:

FCOPY 'C:\demo1.emc','D:\demo1.emc';

FCOPY 'C:\demo2.emt','D:\demo2.emt';

MMEM:COPY 'C:\demo1.emc','D:\demo1.emc';

MMEM:COPY 'C:\demo2.emt','D:\demo2.emt';

FRENAME

:MMEMory:MOVE

File Rename

Function: Rename the selected file.

Remote Command: FRENAME△'src_file_name','dest_file_name'

:MMEMory:MOVE△'src_file_name','dest_file_name'

Value of src_file_name, dest_file_name

File Path + File Name

Example:

```
FRENAME 'C:\demo1.emc','C:\demo1_1.emc';
FRENAME 'C:\demo2.emt','C:\demo2_1.emt';
MMEM:MOVE 'C:\demo1.emc','C:\demo1_1.emc';
MMEM:MOVE 'C:\demo2.emt','C:\demo2_1.emt';
```

FMOVE

MMEMory:DATA

	File Move
Function	Sends or receives binary data of selected file. Maximum size of sent file is 2 Mbyte, and maximum size of received file is30 MByte.
Remote Command	FMOVE△‘file_name’,definite_length_block
	FMOVE?△‘file_name’
	MMEMory:DATA△‘file_name’,definite_length_block
	MMEMory:DATA?△‘file_name’
Value of file_name	File Path + File Name
Value of definite_length_block	# + number of file size + file size + file data
Example	FMOVE ‘C:\Sended_Sample.txt’,#14abcd; cf) #+1+4+abcd
	FMOVE? ‘C:\Received_Sample.txt’;
	MMEM:DATA ‘C:\ Sended_Sample.txt’,#14abcd;
	MMEM:DATA? ‘C:\ Received_Sample.txt’;

Frequency

CF

[:SENSe]:FREQuency:CENTer

Center Frequency (Debug/CISPR mode only)

Function	Sets the center frequency. If the center frequency is set to near the boundary frequency, the span value would not be satisfied. In this case, the span value is adjusted automatically.
Remote Command	CF△f
	CF?
	[:SENSe]:FREQuency:CENTer△f
	[:SENSe]:FREQuency:CENTer?
Response Message	Center Frequency (Hz)
Value of f	20 Hz to 3.0 GHz / 20 Hz to 13.2 GHz / 20 Hz to 26.5 GHz
Suffix code	None : Hz(10^0)
HZ	: Hz (10^0)
KHZ	: kHz(10^3)
MHZ	: MHz(10^6)
GHZ	: GHz(10^9)
Example	CF 123456;
	CF 50MHZ;
	CF?;
	FREQ:CEN7T 123456;
	FREQ:CENT 50MHZ;
	FREQ:CENT?;

FA

[:SENSe]:FREQuency:STARt

	Start Frequency (Scan/Debug mode only)
Function	Sets the start frequency. If the start frequency is set to near the boundary frequency, the span value is not satisfied. In thiscase, the span value is adjusted automatically
Remote Command	FA△f
	FA?
	[:SENSe]:FREQuency:STARt△f
	[:SENSe]:FREQuency:STARt?
Response Message	Start Frequency (Hz)
Value of f	20 Hz to 3.0 GHz-10 Hz / 20 Hz to 13.2 GHz-10 Hz / 20 Hz to 26.5 GHz-10 Hz
Suffix code	None : Hz(10^0)
HZ	: Hz (10^0)
KHZ	: kHz(10^3)
MHZ	: MHz (10^6)
GHZ	: GHz (10^9)
Example	FA 123456;
	FA 50MHZ;
	FA?;
	FREQ:STAR 123456;
	FREQ:STAR 50MHZ;
	FREQ:STAR?;

FB

[:SENSe]:FREQuency:STOP

	Stop Frequency (Scan/Debug mode only)
Function	Sets the stop frequency. If the stop frequency is set to near the boundary frequency, the span value is not satisfied. In this case, the span value is adjusted automatically.
Remote Command	FB△f
	FB?
	[:SENSe]:FREQuency:STOP△f
	[:SENSe]:FREQuency:STOP?
Response Message	Stop Frequency (Hz)
Value of f	20 Hz+10 Hz to 3.0 GHz / 20 Hz+10 Hz to 13.2 GHz / 20 Hz+10 Hz to 26.5 GHz
Suffix code	None : Hz (10^0)
HZ	: Hz (10^0)
KHZ	: kHz (10^3)
MHZ	: MHz (10^6)
GHZ	: GHz (10^9)
Example	FB 123456;
	FB 50MHZ;
	FB?;
	FREQ:STOP 123456;
	FREQ:STOP 50MHZ;
	FREQ:STOP?;

SS

[:SENSe]:FREQuency:CENTer:STEP[:INCRement]

	CF Step (Debug mode only)
Function	Sets the center frequency step size.
Remote Command	SS△f
	SS?
	[:SENSe]:FREQuency:CENTer:STEP[:INCRement]△f
	[:SENSe]:FREQuency:CENTer:STEP[:INCRement]?
Response Message	CF Step (Hz)
Value of f	1 Hz to 3.0 GHz / 13.2 GHz / 26.5 GHz
Suffix code	None : Hz (10^0)
HZ	: Hz (10^0)
KHZ	: kHz (10^3)
MHZ	: MHz (10^6)
GHZ	: GHz (10^9)
Initial setting	10% of Span
Example	SS 123456;
	SS 50MHZ;
	SS?;
	FREQ:CENT:STEP 123456;
	FREQ:CENT:STEP 50MHZ;
	FREQ:CENT:STEP?;

SSA

[:SENSe]:FREQuency:CENTer:STEP:AUTO

	CF Step Auto (Debug mode only)	
Function	Sets the cf step to auto or manual mode.	
Remote Command	SSA△n	
	SSA△sw	
	SSA?	
	[:SENSe]:FREQuency:CENTer:STEP:AUTO△n	
	[:SENSe]:FREQuency:CENTer:STEP:AUTO△sw	
	[:SENSe]:FREQuency:CENTer:STEP:AUTO?	
Response Message	1	: Auto
	0	: Manual
Value of n	1	: Auto
	0	: Manual
Value of sw	ON	: Auto
	OFF	: Manual
Initial setting	1	
Example	SSA 1;	
	SSA ON;	
	SSA?;	
	FREQ:CENT:STEP:AUTO 1;	
	FREQ:CENT:STEP:AUTO ON;	
	FREQ:CENT:STEP:AUTO?;	

Limit Line

LLCS[1~3]

:CALCulate:LLINe[1~3]:CHECk:STATe

	Limit Line Check State (Scan/Debug mode only)	
Function	Turns limit line checking on or off.	
Remote Command	LLCS[1~3]△n	
	LLCS[1~3]△sw	
	LLCS[1~3]?	
	:CALCulate:LLINe[1~3]:CHECk:STATe△n	
	:CALCulate:LLINe[1~3]:CHECk:STATe△sw	
	:CALCulate:LLINe[1~3]:CHECk:STATe?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	LLCS 1;	
	LLCS2 ON	
	LLCS2?	
	CALC:LLIN:CHEC:STAT 1;	
	CALC:LLIN2:CHEC:STAT ON;	
	CALC:LLIN2:CHEC:STAT?	

LLFC[1~3]

:CALCulate:LLINe[1~3]:FAIL:COUNt

	Limit Line Fail Count (Scan/Debug mode only)
Function	Returns the limit line Fail Count.
Remote Command	LLFC[1~3]?
	:CALCulate:LLINe[1~3]:FAIL:COUNt?
Response Message	Fail Count
Initial setting	0
Example	LLFC?;
	LLFC2?;
	CALC:LLIN:FAIL:COUNt?;
	CALC:LLIN2:FAIL:COUNt?;

ALARM

:CALCulate:LLINe:ALARM

	Alarm State (Scan/Debug mode only)	
Function	Turns the alarm state on or off	
Remote Command	ALARM△n	
	ALARM△sw	
	ALARM?	
	:CALCulate:LLINe:ALARM△n	
	:CALCulate:LLINe:ALARM△sw	
	:CALCulate:LLINe:ALARM?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
OFF	: OFF	
Initial setting	0	
Example	ALARM 1;	
	ALARM ON	
	ALARM?	
	CALC:LLIN:ALARM 1;	
	CALC:LLIN2:ALARM ON;	
	CALC:LLIN2:ALARM?	

LLAO

:CALCulate:LLINe:AOFF

	Clear Limit Line (Scan/Debug mode only)
Function	Clear Limit Line.
Remote Command	LLAO
	:CALCulate:LLINe:AOFF?
Example	LLAO;
	CALC:LLIN:AOFF?;

Note: You can insert X, Y Data of the Limit Line after loading the EMC Limit File(*.*emt*).

Marker

MS[1~9]

:CALCulate:MARKer[1~9]:STATe

	Marker State (Scan/Debug mode only)	
Function	Sets the selected marker state.	
Remote Command	MS[1~9]△n	
	MS[1~9]△sw	
	MS[1~9]?	
	:CALCulate:MARKer[1~9]:STATe△n	
	:CALCulate:MARKer[1~9]:STATe△sw	
	:CALCulate:MARKer[1~9]:STATe?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	MS 1;	
	MS5 1;	
	MS5?;	
	CALC:MARK:STAT 1;	
	CALC:MARK5:STAT ON;	
	CALC:MARK5:STAT?	

MM[1~9]

:CALCulate:MARKer[1~9]:MODE

	Marker mode (Scan/Debug mode only)	
Function	Sets the selected marker to Normal, Delta mode.	
Remote Command	MM[1~9]△sw	
	MM[1~9]?	
	:CALCulate:MARKer[1~9]:MODE△sw	
	:CALCulate:MARKer[1~9]:MODE?	
Response Message	POS	: Normal
	DELT	: Delta
	OFF	: OFF
Value of sw	POSition	: Normal
	DELTa	: Delta
	OFF	: OFF
Initial setting	OFF	
Example	MM POS;	
	MM5 DELT;	
	MM5?;	
	CALC:MARK:MODE POS;	
	CALC:MARK5:MODE DELT;	
	CALC:MARK5:MODE?	

MF[1~9]

:CALCulate:MARKer[1~9]:X

	Marker Frequency (Scan/Debug mode only)
Function	Sets the marker frequency of the selected marker. If the marker mode is the delta mode, sets the difference value of the marker frequency and the delta marker frequency.
Remote Command	MF[1~9]△f
	MF[1~9]?
	:CALCulate:MARKer[1~9]:X△f
	:CALCulate:MARKer[1~9]:X?
Response Message	Marker Frequency (Hz)
Value of f	Start Frequency to Stop Frequency
Suffix code	None : Hz (10^0)
HZ	: Hz (10^0)
KHZ	: kHz (10^3)
MHZ	: MHz (10^6)
GHZ	: GHz (10^9)
Initial setting	Center Frequency
Example	MF 123456;
	MF5 1GHZ;
	MF5?;
	CALC:MARK:X 123456;
	CALC:MARK5:X 1GHZ;
	CALC:MARK5:X?

MA[1~9]

:CALCulate:MARKer[1~9]:Y

	Marker Amplitude (Scan/Debug mode only)
Function	Returns amplitude data.
Remote Command	MA[1~9]?
	:CALCulate:MARKer[1~9]:Y?
Response Message	Marker Amplitude (Hz in FREQ or ITIME, sec in PER or TIME)
Example	MA?;
	MA5?
	CALC:MARK:Y?
	CALC:MARK5:Y?

MT[1~9]

:CALCulate:MARKer[1~9]:TRACe

	Select Marker Trace (Scan/Debug mode only)	
Function	Selects the marker trace.	
Remote Command	MT[1~9]△n	
	MT[1~9]?	
	:CALCulate:MARKer[1~9]:MKT△n	
	:CALCulate:MARKer[1~9]:MKT?	
Response Message	1	: Trace A
	2	: Trace B
	3	: Trace C
Value of n	1	: Trace A
	2	: Trace B
	3	: Trace C
Initial setting	1	
Example	MT 2;	
	MT5 2;	
	MT5?;	
	CALC:MARK:TRAC 2;	
	CALC:MARK5:TRAC 2;	
	CALC:MARK5:TRAC?;	

MTB

:CALCulate:MARKer:TABLe:STATe

	Marker Table State (Debug mode only)	
Function	Sets the marker table state.	
Remote Command	MTB△n	
	MTB△sw	
	MTB?	
	:CALCulate:MARKer:TABLe:STATe△n	
	:CALCulate:MARKer:TABLe:STATe△sw	
	:CALCulate:MARKer:TABLe:STATe?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	MTB 1;	
	MTB ON;	
	MTB?;	
	CALC:MARK:TABL:STAT 1;	
	CALC:MARK:TABL:STAT ON;	
	CALC:MARK:TABL:STAT?;	

MAO

:CALCulate:MARKer:AOFF

Marker All OFF (Scan/Debug mode only)

Function	Turns off all of the markers.
Remote Command	MAO :CALCulate:MARKer:AOFF
Example	MAO; CALC:MARK:AOFF;

Measurement

MEA

:MEASure:STARt

	Measure Start	
Function	Starts the measurement.	
Remote Command	MEA△sw	
	MEA?	
	:MEASure:STARt△sw	
	:MEASure:STARt?	
Response Message	SCAN	: Scan mode
	DEBUG	: Debug mode
	CISPR	: CISPR mode
Value of sw	SCAN	: Scan mode
	DEBUG	: Debug mode
	CISPR	: CISPR mode
Example	MEA SCAN;	
	MEA?;	
	MEAS:STAR SCAN;	
	MEAS:STAR?;	

Note: You can insert EMC Config data after loading EMC Config File (**.emc*) in SCAN mode.

Meas. Control

SCAN

:MEASure:SCAN

	Scan (Scan mode only)	
Function	Starts or stops Scan mode.	
Remote Command	SCAN△sw	
	:MEASure:SCAN△sw	
Value of sw	RUN	: Start Scan
	HOLD	: Hold Scan
	STOP	: Stop Scan
Example	SCAN START;	
	MEAS:SCAN START;	

RTYPE

	Repetition (Scan mode only)	
Function	Sets Run Type to Single or Continuous.	
Remote Command	RTYPE△sw	
	RTYPE?	
Response Message	SING	: Single mode
	CONT	: Continuous mode
Value of sw	SINGle	: Single mode
	CONT	: Continuous mode
Example	RTYPE SING;	
	RTYPE?;	

SINFO

	Scan Info (Scan mode only)	
Function	Sets Scan Info to ON or OFF.	
Remote Command	SINFO△n	
	SINFO△sw	
	SINFO?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	SINFO 1;	
	SINFO ON;	
	SINFO?;	

Mode

MODE

:INSTrument[:SELect]

	Mode	
Function	Sets current mode.	
Remote Command	MODE△sw	
	MODE?	
	:INSTrument[:SELect]△sw	
	:INSTrument[:SELect]?	
Response Message	SA	: Spectrum mode
	EMC	: EMC mode
Value of sw	SA	: Spectrum mode
	EMC	: EMC mode
Initial setting	SA	
Example	MODE SA;	
	MODE?;	
	INST SA;	
	INST?;	

Mode setup

TRANGE

	Max Range (Scan mode only)
Function	Sets the total range number.
Remote Command	TRANGE△n
	TRANGE?
Response Message	Total Range Number
Value of n	1 to 6
Initial setting	3
Example	TRANGE 3;
	TRANGE?;

STYPE

	Config Type (Scan mode only)	
Function	Sets Scan Type of Scan mode.	
Remote Command	STYPE△sw	
	STYPE?	
Response Message	DFLT	: Default mode
	MANL	: Manual mode
Value of sw	DFLT	: Default mode
	MANL	: Manual mode
Initial setting	MANL	
Example	STYPE MANL;	
	STYPE?;	

FSTEP

	Scan mode (Scan mode only)	
Function	Sets Freq Step of Scan mode.	
Remote Command	FSTEP△sw	
	FSTEP?	
Response Message	LIN	: Linear mode
	LOG	: Logarithmic mode
Value of sw	LINear	: Linear mode
	LOGarithmic	: Logarithmic mode
Initial setting	LOG	
Example	FSTEP LOG;	
	FSTEP?;	

DETPK

	Peak Detector (Scan/CISPR mode only)	
Function	Sets Peak Detector to ON or OFF.	
Remote Command	DETPK△n	
	DETPK△sw	
	DETPK?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	1	
Example	DETPK 1;	
	DETPK ON;	
	DETPK?;	

DETAV

	Average Detector (Scan/CISPR mode only)	
Function	Sets Average Detector to ON or OFF.	
Remote Command	DETAV△n	
	DETAV△sw	
	DETAV?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	DETAV 1;	
	DETAV ON;	
	DETAV?;	

DETLOG

	Log-Average Detector (Scan/CISPR mode only)	
Function	Sets Log-Average Detector to ON or OFF.	
Remote Command	DETLOG△n	
	DETLOG△sw	
	DETLOG?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	DETLOG 1;	
	DETLOG ON;	
	DETLOG?;	

DETRMS

	RMS-Average Detector (Scan/CISPR mode only)	
Function	Sets RMS-Average Detector to ON or OFF.	
Remote Command	DETRMS△n	
	DETRMS△sw	
	DETRMS?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	DETRMS 1;	
	DETRMS ON;	
	DETRMS?;	

DETCISPR

	CISPR-Average Detector (Scan/CISPR mode only)	
Function	Sets CISPR-Average Detector to ON or OFF.	
Remote Command	DETCISPR△n	
	DETCISPR△sw	
	DETCISRP?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	DETCISPR 1;	
	DETCISPR ON;	
	DETCISPR?;	

DETQP

	Quasi-Peak Detector (Scan/CISPR mode only)	
Function	Sets Quasi-Peak Detector to ON or OFF.	
Remote Command	DETQP△n	
	DETQP△sw	
	DETQP?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	DETQP 1;	
	DETQP ON;	
	DETQP?;	

Peak Search

MPK[1~9]

:CALCulate:MARKer[1~9]:MAXinum

	Peak Search (Scan/Debug mode only)
Function	Places the selected marker on the highest point of the marker trace.
Remote Command	MPK[1~9]
	:CALCulate:MARKer[1~9]:MAXinum
Example	MPK;
	MPK5:
	CALC:MARK:MAX;
	CALC:MARK5:MAX;

MPKN[1~9]

:CALCulate:MARKer[1~9]:MAXinum:NEXT

	Next Peak Search (Scan/Debug mode only)
Function	Places the selected marker on the next highest point of the marker trace.
Remote Command	MPKN[1~9]
	:CALCulate:MARKer[1~9]:MAXinum:NEXT
Example	MPKN;
	MPKN5:
	CALC:MARK:MAX:NEXT;
	CALC:MARK5:MAX:NEXT;

MPKL[1~9]

:CALCulate:MARKer[1~9]:MAXinum:LEFT

	Next Left Peak Search (Scan/Debug mode only)
Function	Places the selected marker on the next-left peak point of the marker trace.
Remote Command	MPKL[1~9]
	:CALCulate:MARKer[1~9]:MAXinum:LEFT
Example	MPKL;
	MPKL5:
	CALC:MARK:MAX:LEFT;
	CALC:MARK5:MAX:LEFT;

MPKR[1~9]

:CALCulate:MARKer[1~9]:MAXinum:RIGHt

Next Right Peak Search (Scan/Debug mode only)

Function	Places the selected marker on the next-right peak point of the marker trace.
Remote Command	MPKR[1~9] :CALCulate:MARKer[1~9]:MAXinum:RIGHt
Example	MPKR; MPKR5: CALC:MARK:MAX:RIGH; CALC:MARK5:MAX:RIGH;

MPKM

:CALCulate:MARKer[1~9]:MINinum

	Minimum Search (Scan/Debug mode only)
Function	Places the selected marker on the minimum level point of the marker trace.
Remote Command	MPKM[1~9] :CALCulate:MARKer[1~9]:MINinum
Example	MPKM; MPKM5: CALC:MARK:MIN; CALC:MARK5:MIN;

MPKP

:CALCulate:MARKer[1~9]:PTPeak

	Peak to Peak Search (Scan/Debug mode only)
Function	Places the selected reference marker on the minimum level point and places the selected delta marker on the maximum level point.
Remote Command	MPKP[1~9]
	:CALCulate:MARKer[1~9]:PTPeak
Example	MPKP;
	MPKP5:
	CALC:MARK:PTP;
	CALC:MARK5:PTP;

MMPKN

:CALCulate:MARKer:PEAK:MULTi:NUMber

	Marker Multi Peak Number (Scan/Debug mode only)
Function	Sets the multi peak number.
Remote Command	MKPKN△n
	MKPKN?
	:CALCulate:MARKer:PEAK:MULTi:NUMber△n
	:CALCulate:MARKer:PEAK:MULTi:NUMber?
Response Message	Multi Peak Number
Value of n	1 to 9
Initial setting	9
Example	MMPKN 5;
	MMPKN?;
	CALC:MARK:PEAK:MULT:NUM 5;
	CALC:MARK:PEAK:MULT:NUM?;

MMPK

:CALCulate:MARKer:PEAK:MULTi

	Marker Multi Peak (Scan/Debug mode only)
Function	Searches Multi Peak and places each marker.
Remote Command	MMPK :CALCulate:MARKer:PEAK:MULTi
Example	MMPK; CALC:MARK:PEAK:MULT;

MMPKT

:CALCulate:MARKer:PEAK:MULTi:TRACe

	Marker Multi Peak Trace (Scan/Debug mode only)
Function	Sets the multi peak trace.
Remote Command	MKPKT△n
	MKPKT?
	:CALCulate:MARKer:PEAK:MULTi:TRACe△n
	:CALCulate:MARKer:PEAK:MULTi:TRACe?
Response Message	Multi Peak Trace
Value of n	1 to 3
Initial setting	1
Example	MMPKT 1;
	MMPKT?;
	CALC:MARK:PEAK:MULT:TRAC 1;
	CALC:MARK:PEAK:MULT:TRAC?;

MPKE

:CALCulate:MARKer:PEAK:EXCursion

	Marker Peak Search Excursion (Debug mode only)
Function	Sets the peak least amplitude for peak search. It is valid when MPKPA is set to PAR.
Remote Command	MPKE△f
	MPKE?
	:CALCulate:MARKer:PEAK:EXCursion△f
	:CALCulate:MARKer:PEAK:EXCursion?
Response Message	Marker Peak Search Excursion (dB)
Value of f	0.03 dB to 210 dB
Initial setting	3 dB
Example	MPKE 3;
	MPKE 6DB?;
	MPKE?
	CALC:MARK:PEAK:EXC 3;
	CALC:MARK:PEAK:EXC 6DB;
	CALC:MARK:PEAK:EXC?;

MPKTH

:CALCulate:MARKer:PEAK:THReshold

	Marker Peak Search Threshold (Debug mode only)	
Function	Sets the low limit line for peak search. It is valid when MPKPA is set to PAR.	
Remote Command	MPKTH△f	
	MPKTH?	
	:CALCulate:MARKer:PEAK:THReshold△f	
	:CALCulate:MARKer:PEAK:THReshold?	
Response Message	Marker Peak Search Threshold (dBm)	
Value of f	Ref level to -210 dB	
Suffix code	None	: dBm
	DBM	: dBm
	DBMV	: dBmV
	DBUV	: dBuV
	DBMA	: dBmA
	DBUA	: dBuA
	V	: V
	MV	: mV (10^-3 V)
	UV	: uV (10^-6 V)
	NV	: nV (10^-9 V)
	PV	: pV (10^-12 V)
	W	: W
	MW	: mW (10^-3 W)
	UW	: uW (10^-6 W)
	NW	: nW (10^-9 W)
	PW	: pW (10^-12 W)
	FW	: fW (10^-15 W)
	A	: A
	MA	: mA (10^-3 A)
	UA	: uA (10^-6 A)
	NA	: nA (10^-9 A)
	PA	: pA (10^-12 A)
Initial setting	-100 dBm	
Example	MPKTH -80;	
	MPKTH –100DBM?;	
	MPKTH?;	
	CALC:MARK:PEAK:THR –80;	
	CALC:MARK:PEAK:THR –100DBM;	
	CALC:MARK:PEAK:THR?;	

MPKPA

:CALCulate:MARKer:PEAK:SEARch:MODE

	Marker Peak mode (Debug mode only)	
Function	Sets Peak mode to Parameter Or Maximum.	
Remote Command	MPKPA△sw	
	MPKPA?	
	:CALCulate:MARKer:PEAK:SEARch:MODE△sw	
	:CALCulate:MARKer:PEAK:SEARch:MODE?	
Response Message	PAR	: Parameter
	MAX	: MAXimum
Value of sw	PARameter	: Parameter
MAXimum	: Maximum	
Initial setting	PAR	
Example	MPKPA PAR;	
	MPKPA?;	
	CALC:MARK:PEAK:SEAR:MODE PAR;	
	CALC:MARK:PEAK:SEAR:MODE?;	

Preselector

PRESEL

	Preselector control	
Function	Enables or disables the preselector.	
Remote Command	PRESEL△n	
	PRESEL△sw	
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Example	PRESEL ON	
	PRESEL 0	

PRESELFILTER

	Preselector filter	
Function	Selects a frequency range for the preselector filter.	
Remote Command	PRESELFILTER△n	
Value of n	0	:Bypass
	1	:DC–150kHz
	2	:150–600kHz
	3	:600–1.2MHz
	4	:1.2–2.5MHz
	5	:2.5–5.0MHz
	6	:5.0–10MHz
	7	:10–30MHz
Example	PRESELFILTER 2	

Preset

PRST

:SYSTem:PRESet

	Preset
Function	Executes preset. All instrument parameters are set to default values.
Remote Command	PRST
	:SYSTem:PRESet
Example	PRST;
	SYST:PRES;

Printer

HCOPY

:HCOPy[:IMMediate]

	Hard Copy
Function	Prints entire screen image.
Remote Command	HCOPY
	:HCOPy[:IMMediate]
Example	HCOPY;
	HCOP;

Span

SP

[:SENSe]:FREQuency:SPAN

	Span (Debug mode only)
Function	Sets the span.
Remote Command	SP△f
	SP?
	[:SENSe]:FREQuency:SPAN△f
	[:SENSe]:FREQuency:SPAN?
Response Message	Span (Hz)
Value of f	0 Hz, 10 Hz to 3.0 GHz-10 Hz/ 0 Hz, 10 Hz to 13.2 GHz-10 Hz/ 0 Hz, 10 Hz to 26.5 GHz-10 Hz
Suffix code	None : Hz(10^0)
HZ	: Hz (10^0)
KHZ	: kHz (10^3)
MHZ	: MHz (10^6)
GHZ	: GHz (10^9)
Example	SP 123456;
	SP 50MHZ;
	SP ?;
	FREQ:SPAN 123456;
	FREQ:SPAN 50MHZ;
	FREQ:SPAN?;

FS

[:SENSe]:FREQuency:SPAN:FULL

	Full Span (Debug mode only)
Function	Sets the full span.
Remote Command	FS
	[:SENSe]:FREQuency:SPAN:FULL
Example	FS;
	FREQ:SPAN:FULL;

LS

[:SENSe]:FREQuency:SPAN:PREVious

	Last Span (Debug mode only)
Function	Changes to twice the previous span. Span is varied in the range that allows the center frequency to be held.
Remote Command	LS
	[:SENSe]:FREQuency:SPAN:PREVious
Example	LS;
	FREQ:SPAN:PREV;

ZI

[:SENSe]:FREQuency:SPAN:ZIN

Zoom-In (Debug mode only)

Function	Changes to 50% of the current span.
Remote Command	ZI [:SENSe]:FREQuency:SPAN:ZIN
Example	ZI; FREQ:SPAN:ZIN;

ZO

[:SENSe]:FREQuency:SPAN:ZOUT

	Zoom-Out (Debug mode only)
Function	Changes to 200% of the current span.
Remote Command	ZO
	[:SENSe]:FREQuency:SPAN:ZOUT
Example	ZO;
	FREQ:SPAN:ZOUT;

Sweep

ST

[:SENSe]:SWEep:TIME

	Sweep Time (Debug/CISPR mode only)	
Function	Sets the sweep time or measurement time.	
Remote Command	ST△f	
	ST?	
	[:SENSe]:SWEep:TIME△f	
	[:SENSe]:SWEep:TIME?	
Response Message	Sweep Time (s)	
Value of f	5 ms to 2000 s	: Sweep mode
	1 µs to 2000 s	: Zero Span mode
Suffix code t	None	: s (10^0)
	KSEC	: ks (10^3)
	SEC	: s (10^0)
	MSEC	: ms (10^-3)
	USEC	: µs (10^-6)
	NSEC	: ns (10^-9)
	PSEC	: ps (10^-12)
Initial setting	100 ms	
Example	ST 100;	
	ST 50MSEC	
	ST?;	
	SWE:TIME 100;	
	SWE:TIME 50MSEC;	
	SWE:TIME?;	

STA

[:SENSe]:SWEep:TIME:AUTO

	Sweep Time Auto (Debug mode only)	
Function	Sets the sweep time mode to auto or manual mode.	
Remote Command	STA△n	
	STA△sw	
	STA?	
	[:SENSe]:SWEep:TIME:AUTO△n	
	[:SENSe]:SWEep:TIME:AUTO△sw	
	[:SENSe]:SWEep:TIME:AUTO?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	1	
Example	STA 1;	
	STA ON;	
	STA?	
	SWE:TIME:AUTO 1;	
	SWE:TIME:AUTO ON;	
	SWE:TIME:AUTO?;	

CO

:INITiate:CONTinuous

Continuous Sweep

Function	Sets the continuous sweep mode. Repeats active sweep.
Remote Command	CO :INITiate:CONTinuous
Example	CO; INIT:CONT;

SI

:INITiate[:IMMediate]

Single Sweep

Function	Sets the single sweep mode. After active sweep, stop repeating the sweep.
Remote Command	SI :INITiate[:Immediate]
Example	SI; INIT;

System

BEEP

Beep

Function	Turns Beep ON or OFF when pressing key pad.	
Remote Command	BEEP△n	
	BEEP△sw	
	BEEP?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	BEEP 1;	
	BEEP ON;	
	BEEP?;	

ECHO

Echo

Function	Turns Echo ON or OFF when controlled by hyper teminal.	
Remote Command	ECHO△n	
	ECHO△sw	
	ECHO?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	1	
Example	ECHO 1;	
	ECHO ON;	
	ECHO?;	

Trace

TRF[1~3]

:TRACe[1~3]:MODE

	Trace Status (Debug mode only)	
Function	Sets the trace status.	
Remote Command	TRF△sw	
	TRF?	
	:TRACe[1~3]:MODE△sw	
	:TRACe[1~3]:MODE?	
Response Message	WRIT	: Clear & Wirte
	MAXH	: Max Hold
	MINH	: Min Hold
	VIEW	: View
	BLAN	: Blank
Value of sw	WRITe	: Clear & Wirte
	MAXHold	: Max Hold
	MINHold	: Min Hold
	VIEW	: View
	BLANk	: Blank
Initial setting	WRIT	: Trace A
	BLAN	: Trace B
	BLAN	: Trace C
Example	TRF WRIT;	
	TRF3 MAXH;	
	TRF3?	
	TRAC:MODE WRIT;	
	TRAC3:MODE MAXH;	
	TRAC3:MODE?;	

TRD

:TRACe[:DATA]

	Query Trace Data (Scan mode only)
Function	Queries the scan level data in Scan mode.
Remote Command	TRD?△sw
	:TRACe[:DATA]?△sw
Response Message	Data[0],Data[1],Data[2]……
Value of sw	TRACE1 : Trace A
	TRACE2 : Trace B
	TRACE3 : Trace C
Example	TRD? TRACE1;
	TRAC? TRACE1;

TRDF

:TRACe[:DATA]:FREQuency

	Query Trace Data (Scan mode only)
Function	Queries the scan frequency data in Scan mode.
Remote Command	TRD?△sw
	:TRACe[:DATA]?△sw
Response Message	Data[0],Data[1],Data[2]……
Value of sw	TRACE1 : Trace A
	TRACE2 : Trace B
	TRACE3 : Trace C
Example	TRDF? TRACE1;
	TRAC:FREQ? TRACE1;

TRD

:TRACe[:DATA]

	Send/Query Trace Data (Debug mod only e)
Function	Sends the trace data or queries the trace data. The amount of Send/Query data changes, depending on the sweep point.
Remote Command	TRD△sw,data1,data2,data3……
	TRD?△sw
	:TRACe[:DATA]△sw
	:TRACe[:DATA]?△sw
Response Message	Data[0],Data[1],Data[2]……(Num: Points)
Value of sw	TRACE1 : Trace A
	TRACE2 : Trace B
	TRACE3 : Trace C
Example	TRD TRACE1,-80,-70,-50,-40,-50,-60,-70,-80;
	TRD? TRACE1;
	TRAC TRACE1,-80,-70,-50,-40,-50,-60,-70,-80;
	TRAC? TRACE1;

TRD

:TRACe[:DATA]

	Query Trace Data (CISPR mode only)
Function	Queries the detector level data in CISPR mode.
Remote Command	TRD?△sw
	:TRACe[:DATA]?△sw
Response Message	Peak, Average, Quasi-Peak(Hold), Quasi-Peak(Present)
Value of sw	CISPR : Detector
Example	TRD? CISPR;
	TRAC? CISPR;

TDF

:TRACe:FORMat

	Trace Format	
Function	Sets the trace format.	
Remote Command	TDF△sw	
	TDF?	
	:TRACe:FORMat△sw	
	:TRACe:FORMat?	
Response Message	ASC	: ASCii Code
	REAL,64	: 8 Byte Real
	INT,32	: 4 Byte Integer
REAL,32	: 4 Byte Real	
Value of sw	ASCii	: Ascii Code
	REAL,64	: 8 Byte Real
	INTger,32	: 4 Byte Integer
	REAL,32	: 4 Byte Real
Initial setting	ASCii Code	
Example	TDF ASC;	
	TDF?	
	TRAC:FORM ASC;	
	TRAC:FORM?;	

Trigger

TSO

:TRIGger[:SEQuence]:SOURce

	Trigger Source	
Function	Sets the trigger switch and the trigger source.	
Remote Command	TSO△sw	
	TSO?	
	:TRIGger[:SEQuence]:SOURce△sw	
	:TRIGger[:SEQuence]:SOURce?	
Response Message	IMM	: Selects the Free-run mode
	EXT	: Selects the External mode
Value of sw	IMMediate	: Selects the Free-run mode
	EXTernal	: Selects the External mode
Initial setting	IMM	
Example	TSO IMM;	
	TSO?;	
	TRIG:SOUR IMM;	
	TRIG:SOUR?;	

TSL

:TRIGger[:SEQuence]:SLOPe

	Trigger Slope
Function	Selects the trigger slope type.
Remote Command	TSL△sw
	TSL?
	:TRIGger[:SEQuence]:SLOPe△sw
	:TRIGger[:SEQuence]:SLOPe?
Response Message	POS
	NEG
Value of sw	POSitive
	NEGative
Initial setting	POS
Example	TSL POS;
	TSL?;
	TRIG:SLOP POS;
	TRIG:SLOP?;

GPIB common commands

This section gives detailed descriptions of commands that are common for all measurement modes.

*CLS

	Clear Status Command
Function	Clears the status byte register.
Remote Command	*CLS
Example	*CLS;

*ESE

	Standard Event Status Enable
Function	Sets the standard event status enable register.
Remote Command	*ESEΔn
	*ESE?
Response Message	Register Value
Value of n	0 to 255: Represents the sum of the bit-weighted values.
Example	*ESE 20:
	*ESE?;

*ESR?

	Standard Event Status Register Query
Function	Returns the current value in the standard event status register.
Remote Command	*ESR?
Response Message	Register Value
Example	*ESR?;

*IDN?

	Identification Query
Function	Returns the model name, etc of the equipment
Remote Command	*IDN?
Response Message	Company, Model, Serial, Version
Example	*IDN?;

*OPC

	Operation Complete Command
Function	Sets the standard event register bit 0 to 1 when the requested action is complete.
Remote Command	*OPC
Example	*OPC;

*OPC?

	Operation Complete Query
Function	Sets the output queue to 1 to generate a MAV summary message when all pending select device operations have completed.
Remote Command	*OPC?
Response Message	1
Example	*OPC?;

*RST

	Rest Command
Function	Resets the device.
Remote Command	*RST
Example	*RST;

*SRE

	Service Request Enable Command
Function	Sets the bits in the service request enable register.
Remote Command	*SREΔn
	*SRE?
Response Message	Register Value
Value of n	0 to 255: Represents the sum of the bit-weighted values.
Example	*SRE 32;
	*SRE?;

*STB?

Returns Status Byte Command

Function Returns the current values of the status bytes including the MSS bit.

Remote Command *STB?

Response Message Register Value

Bit	Bit Weight	Bit Name	Condition of status byte register
7	128	----	0 = Not used
6	64	MSS	0 = Service not requested 1 = Service requested
5	32	ESB	0 = Event status not generated 1 = Event status generated
4	16	MAV	0 = No data in output queue 1 = Data in output queue
3	8	ESB2	0 = Event status not generated 1 = Event status generated
2	4	----	0 = Not used
1	2	----	0 = Not used
0	1	----	0 = Not used

Example *STB?;

GPIB common commands — others

ESE2

	Event Status Enable (End)
Function	Allows the End Event Status Enable Register to select which bit in the corresponding Event Register cause a TRUE ESB summary message bit 3 when set.
Remote Command	ESE2Δn
	ESE2?
Response Message	Register Value
Value of n	0 to 255: Represents the sum of the bit-weighted values.
Example	ESE2 1;
	ESE2?;

ESR2?

Event Status Register (End) Query

Function: Allows the sum of binary-weighted event bit values of the End Event Status Register to be read out by converting them to decimal. After readout, the End Event status Register is reset to 0.

Remote Command: ESR2?

Response Message: Register Value

Bit	Bit Weight	Event	Description
7	128	Not used	Not used
6	64	Not used	Not used
5	32	Not used	Not used
4	16	Measurement completed	Measurement has completed (Peak search, OBW, X dB, Noise marker, Freq. Counter, Limit Pass/Fail..)
3	8	AUTO TUNE completed	AUTO TUNE has completed.
2	4	Averaging completed	Sweeping according to the specified AVERAGE number has completed.
1	2	Calibration completed	Temp Cal, Pre-Filter Cal, ZNC Cal,. Level Cal.. has completed.
0	1	Sweep completed	A single sweep has completed or is in standby.

Example: ESR2?;

ERR

	Error Code	
Function	Returns the error code of the current function.	The error code is cleared.
Remote Command	ERR?	
Response Message	Error code	
Example	ERR?;	

Appendix A
REMOTE COMMANDS

In order of function

Index	Description	SA Command	SCPI Command	Suffix
Amplitude	Reference Level	RL	:DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel	<amplitude>|?
Amplitude	Attenuation	AT	[:SENSe]:POWer[:RF]:ATTenuation	<amplitude>|?
Amplitude	Attenuation Auto	ATA	[:SENSe]:POWer[:RF]:ATTenuation:AUTO	OFF|ON|0|1|?
Amplitude	Scale/Divide	SD	:DISPlay:WINDow:TRACe:Y[:SCALe]:PDIVision	<amplitude>|?
Amplitude	Amplitude Units	AU	:UNIT:POWer	DBM|DBMV|DBMA|V|W|A|DBUV|DBUA|?
Amplitude	Internal Amplifier	IA	[:SENSe]:POWer[:RF]:GAIN[:STATe]	OFF|ON|0|1|?
Amplitude	MW-LNA	IA2		OFF|ON|0|1|?
Amplitude	Apply Corrections	COAS	[:SENSe]:CORRection:CSET:ALL[:STATe]	OFF|ON|0|1|?
Amplitude	Correction State	COA1|2|3|4	[:SENSe]:CORRection:CSET1|2|3|4[:STATe]	OFF|ON|0|1|?
Amplitude	Delete All Corrections	COAD	[:SENSe]:CORRection:CSET:ALL:DELete	none
Bandwidth	Resolution Bandwidth	RB	[:SENSe]:BANDwidth|BWIDth[:RESolution]	<frequency>|?
Display	Full Screen	FSCR	:DISPlay:FSCReen[:STATe]	OFF|ON|0|1|?
Display	Display Line Ampl	DL	:DISPlay:WINDow:TRACe:Y:DLINe	<amplitude>|?
Display	Display Line State	DLS	:DISPlay:WINDow:TRACe:Y:DLINe:STATe	OFF|ON|0|1|?
Display	Threshold Line Ampl	TH	:DISPlay:WINDow:TRACe:Y:TLINe	<amplitude>|?
Display	Threshold Line State	THS	:DISPlay:WINDow:TRACe:Y:TLINe:STATe	OFF|ON|0|1|?
Display	Title	TITLE	:DISPlay:ANNotation:TITLe:DATA	<string>|?
Display	Graticule	GRAT	:DISPlay:WINDow:TRACe:GRATicule:GRID [:STATe]	TYPE1|TYPE|OFF|?
Display	White Mode	WH	:DISPlay:WINDow:WHITe	OFF|ON|0|1|?
File	Read	FREAD	:MMEMory:CATalog	? <`directory_name'>
File	Save	FSAVE	:MMEMory:STORe	<`file_name'>
File	Load	FLOAD	:MMEMory:LOAD	<`file_name'>
File	Delete	FDEL	:MMEMory:DELete	<`file_name'>
File	Copy	FCOPY	:MMEMory:COPY	<`file_name1'>, <`file_name2'>
File	Rename	FRENAME	:MMEMory:MOVE	<`file_name1'>, <`file_name2'>
File	Move	FMOVE	:MMEMory:DATA	<`file_name'>, definite_length|? <'file_name>
Frequency	Center Frequency	CF	[:SENSe]:FREQuency:CENTer	<frequency>|?
Frequency	Start Frequency	FA	[:SENSe]:FREQuency:STARt	<frequency>|?
Frequency	Stop Frequency	FB	[:SENSe]:FREQuency:STOP	<frequency>|?
Frequency	CF Step	SS	[:SENSe]:FREQuency:CENTer:STEP [:INCRement]	<frequency>|?
Frequency	CF Step Auto	SSA	[:SENSe]:FREQuency:CENTer:STEP:AUTO	OFF|ON|0|1|?
Limit Line	Limit Line Check State	LLCS[1~3]	:CALCulate:LLINe[1~3]:CHECk:STATe	OFF|ON|0|1|?
Limit Line	Limit Line Fail Count	LLFC[1~3]	:CALCulate:LLINe[1~3]:FAIL:COUNt	?
Limit Line	Pass/Fail Alarm	ALARM	:CALCulate:LLINe:ALARM	OFF|ON|0|1|?
Limit Line	Clear Limit Line	LLAO	:CALCulate:LLINe:AOFF	none
Marker	Marker State	MS[1~9]	:CALCulate:MARKer[1~9]:STATe	OFF|ON|0|1|?
Marker	Marker Mode	MM[1~9]	:CALCulate:MARKer[1~9]:MODE	POSition|DELTa|OFF|?
Marker	Marker Freq	MF[1~9]	:CALCulate:MARKer[1~9]:X	<frequency>|?
Marker	Marker Amplitude	MA[1~9]	:CALCulate:MARKer[1~9]:Y	?
Marker	Marker Trace	MT[1~9]	:CALCulate:MARKer[1~9]:TRACe	1|2|3|?
Marker	Marker Table	MTB	:CALCulate:MARKer:TABLe:STATe	OFF|ON|0|1|?

Index	Description	SA Command	SCPI Command	Suffix
Marker	Marker All Off	MAO	:CALCulate:MARKer:AOFF	none
Measurement	Meas. Start	MEA	:MEASure:STARt	SCAN|DEBUG|CISPR|?
Meas - Control	Scan	SCAN	:MEASure:SCAN	RUN|HOLD|STOP|?
Meas - Control	Repetition	RTYPE		SINGLE|CONTinuous|?
Meas - Control	Scan Info	SINFO		OFF|ON|0|1|?
Meas - Control	Reset Max/Min Hold	RESETCISPR		none
Mode	Mode	MODE	:INSTrument[:SELect]	SA|EMC|?
Mode - Setup	Max Range	TRANGE		<integer>|?
Mode - Setup	Config Type	STYPE		DFLT|MANL|?
Mode - Setup	Scan Mode	FSTEP		LINear|LOGarithmic|?
Mode - Setup	Detector - Peak	DETPK		OFF|ON|0|1|?
Mode - Setup	Detector - Average	DETAV		OFF|ON|0|1|?
Mode - Setup	Detector - Log-Avg	DETLOG		OFF|ON|0|1|?
Mode - Setup	Detector - RMS-Avg	DETRMS		OFF|ON|0|1|?
Mode - Setup	Detector - CISPR-Avg	DETCISPR		OFF|ON|0|1|?
Mode - Setup	Detector - QuasiPeak	DETQP		OFF|ON|0|1|?
Peak Search	Peak Search	MPK[1~9]	:CALCulate:MARKer[1~9]:MAXinum	none
Peak Search	Next Peak Search	MPKN[1~9]	:CALCulate:MARKer[1~9]:MAXinum:NEXT	none
Peak Search	Next Left Peak Search	MPKL[1~9]	:CALCulate:MARKer[1~9]:MAXinum:LEFT	none
Peak Search	Next Right Peak Search	MPKR[1~9]	:CALCulate:MARKer[1~9]:MAXinum:RIGHt	none
Peak Search	Minimum Search	MPKM[1~9]	:CALCulate:MARKer[1~9]:MINinum	none
Peak Search	Peak to Peak Search	MPKP[1~9]	:CALCulate:MARKer[1~9]:PTPeak	none
Peak Search	Multi Peak Number	MMPKN	:CALCulate:MARKer:PEAK:MULTi:NUMber	<integer>|?
Peak Search	Multi Peak	MMPK	:CALCulate:MARKer:PEAK:MULTi	none
Peak Search	Multi Peak Trace	MMPKT	:CALCulate:MARKer:PEAK:MULTi:TRACe	<integer>|?
Peak Search	Peak Excursn	MPKE	:CALCulate:MARKer:PEAK:EXCursion	<amplitude>|?
Peak Search	Peak Threshold	MPKTH	:CALCulate:MARKer:PEAK:THReshold	<amplitude>|?
Peak Search	Peak Parameter	MPKPA	:CALCulate:MARKer:PEAK:SEARch:MODE	MAX|PARameter|?
Preset	Preset	PRST	:SYSTem:PRESet	none
Printer	Hard Copy	HCOPY	:HCOPy[:IMMediate]	none
Span	Span	SP	[:SENSe]:FREQuency:SPAN	<frequency>|?
Span	Full Span	FS	[:SENSe]:FREQuency:SPAN:FULL	none
Span	Last Span	LS	[:SENSe]:FREQuency:SPAN:PREVious	none
Span	Zoom In	ZI	[:SENSe]:FREQuency:SPAN:ZIN	none
Span	Zoom Out	ZO	[:SENSe]:FREQuency:SPAN:ZOUT	none
Sweep	Sweep Time	ST	[:SENSe]:SWEep:TIME	<time>|?
Sweep	Sweep Time Auto	STA	[:SENSe]:SWEep:TIME:AUTO	OFF|ON|0|1|?
Sweep	Continuous	CO	:INITiate:CONTinuous	OFF|ON|0|1|?
Sweep	Single	SI	:INITiate[:IMMediate]	none
System	Beep	BEEP		OFF|ON|0|1|?
System	Echo	ECHO		OFF|ON|0|1|?
Trace	Trace Function	TRF[1~3]	:TRACe[1~3]:MODE	WRITe|MAXHold|MINHold|VIEW|BLANK|?
Trace	Query Trace Data	TRD	:TRACe[:DATA]	? TRACE1|TRACE2|TRACE3
Trace	Query Trace Data	TRDF	:TRACe[:DATA]:FREQuency	? TRACE1|TRACE2|TRACE3
Trace	Send/Query Trace Data	TRD	:TRACe[:DATA]	? TRACE1|TRACE2|TRACE3

Index	Description	SA Command	SCPI Command	Suffix
Trace	Query Trace Data	TRD	:TRACe[:DATA]	? CISPR
Trace	Trace Data Format	TDF	:TRACe:FORMat	ASCii|REAL,64|INT,32|REAL,32|?
Trigger	Trigger Source	TSO	:TRIGger[:SEQuence]:SOURce	IMMediate|EXTernal|?
Trigger	Trigger Slope	TSL	:TRIGger[:SEQuence]:SLOPe	POSitive|NEGative|?
Common	*CLS	*CLS	*CLS	none
Common	*ESE	*ESE	*ESE	<integer>|?
Common	*ESR	*ESR	*ESR	?
Common	*IDN	*IDN	*IDN	?
Common	*OPC	*OPC	*OPC	?
Common	*RST	*RST	*RST	none
Common	*SRE	*SRE	*SRE	<integer>|?
Common	*STB	*STB	*STB	?
Others	ESE2	ESE2		<integer>|?
Others	ESR2	ESR2		?
Others	Error Code	ERR	:SYSTem:ERRor[:NEXT]	?

In order of SA command

Index	Description	SA Command	SCPI Command	Suffix
Common	*CLS	***CLS**	*CLS	none
Common	*CLS	***CLS**	*CLS	none
Common	*ESE	***ESE**	*ESE	<integer>|?
Common	*ESR	***ESR**	*ESR	?
Common	*IDN	***IDN**	*IDN	?
Common	*OPC	***OPC**	*OPC	?
Common	*RST	***RST**	*RST	none
Common	*SRE	***SRE**	*SRE	<integer>|?
Common	*STB	***STB**	*STB	?
Limit Line	Pass/Fail Alarm	**ALARM**	:CALCulate:LLINe:ALARM	OFF|ON|0|1|?
Amplitude	Attenuation	**AT**	[:SENSe]:POWer[:RF]:ATTenuation	<amplitude>|?
Amplitude	Attenuation Auto	**ATA**	[:SENSe]:POWer[:RF]:ATTenuation:AUTO	OFF|ON|0|1|?
Amplitude	Amplitude Units	**AU**	:UNIT:POWer	DBM|DBMV|DBMA|V|W|A| DBUV|DBUA|?
System	Beep	**BEEP**		OFF|ON|0|1|?
Frequency	Center Frequency	**CF**	[:SENSe]:FREQuency:CENTer	<frequency>|?
Sweep	Continuous	**CO**	:INITiate:CONTinuous	OFF|ON|0|1|?
Amplitude	Correction State	**COA1|2|3|4**	[:SENSe]:CORRection:CSET1|2|3|4[:STATe]	OFF|ON|0|1|?
Amplitude	Delete All Corrections	**COAD**	[:SENSe]:CORRection:CSET:ALL:DELete	none
Amplitude	Apply Corrections	**COAS**	[:SENSe]:CORRection:CSET:ALL[:STATe]	OFF|ON|0|1|?
Mode - Setup	Detector - Average	**DETAV**		OFF|ON|0|1|?
Mode - Setup	Detector - CISPR-Avg	**DETCISPR**		OFF|ON|0|1|?
Mode - Setup	Detector - Log-Avg	**DETLOG**		OFF|ON|0|1|?
Mode - Setup	Detector - Peak	**DETPK**		OFF|ON|0|1|?
Mode - Setup	Detector - QuasiPeak	**DETQP**		OFF|ON|0|1|?
Mode - Setup	Detector - RMS-Avg	**DETRMS**		OFF|ON|0|1|?
Display	Display Line Ampl	**DL**	:DISPlay:WINDow:TRACe:Y:DLINe	<amplitude>|?
Display	Display Line State	**DLS**	:DISPlay:WINDow:TRACe:Y:DLINe:STATe	OFF|ON|0|1|?
System	Echo	**ECHO**		OFF|ON|0|1|?
Others	Error Code	**ERR**	:SYSTem:ERRor[:NEXT]	?
Others	ESE2	**ESE2**		<integer>|?
Others	ESR2	**ESR2**		?
Frequency	Start Frequency	**FA**	[:SENSe]:FREQuency:STARt	<frequency>|?
Frequency	Stop Frequency	**FB**	[:SENSe]:FREQuency:STOP	<frequency>|?
File	Copy	**FCOPY**	:MMEMory:COPY	<`file_name1'>,<`file_name2'>
File	Delete	**FDEL**	:MMEMory:DELete	<`file_name'>
File	Load	**FLOAD**	:MMEMory:LOAD	<`file_name'>
File	Move	**FMOVE**	:MMEMory:DATA	<`file_name'>,definite_length|? <'file_name>
File	Read	**FREAD**	:MMEMory:CATalog	? <`directory_name'>
File	Rename	**FRENAME**	:MMEMory:MOVE	<`file_name1'>,<`file_name2'>

Index	Description	SA Command	SCPI Command	Suffix
Span	Full Span	**FS**	[:SENSe]:FREQuency:SPAN:FULL	none
File	Save	**FSAVE**	:MMEMory:STORe	<`file_name'>
Display	Full Screen	**FSCR**	:DISPlay:FSCReen[:STATe]	OFF|ON|0|1|?
Mode - Setup	Scan Mode	**FSTEP**		LINear|LOGarithmic|?
Display	Graticule	**GRAT**	:DISPlay:WINDow:TRACe:GRATicule:GRID[:STATe]	TYPE1|TYPE|OFF|?
Printer	Hard Copy	**HCOPY**	:HCOPy[:IMMediate]	none
Amplitude	Internal Amplifier	**IA**	[:SENSe]:POWer[:RF]:GAIN[:STATe]	OFF|ON|0|1|?
Amplitude	MW-LNA	**IA2**		OFF|ON|0|1|?
Limit Line	Clear Limit Line	**LLAO**	:CALCulate:LLINe:AOFF	none
Limit Line	Limit Line Check State	**LLCS[1~3]**	:CALCulate:LLINe[1~3]:CHECk:STATe	OFF|ON|0|1|?
Limit Line	Limit Line Fail Count	**LLFC[1~3]**	:CALCulate:LLINe[1~3]:FAIL:COUNt	?
Span	Last Span	**LS**	[:SENSe]:FREQuency:SPAN:PREVious	none
Marker	Marker Amplitude	**MA[1~9]**	:CALCulate:MARKer[1~9]:Y	?
Marker	Marker All Off	**MAO**	:CALCulate:MARKer:AOFF	none
Measurement	Meas. Start	**MEA**	:MEASure:STARt	SCAN|DEBUG|CISPR|?
Marker	Marker Freq	**MF[1~9]**	:CALCulate:MARKer[1~9]:X	<frequency>|?
Marker	Marker Mode	**MM[1~9]**	:CALCulate:MARKer[1~9]:MODE	POSition|DELTa|OFF|?
Peak Search	Multi Peak	**MMPK**	:CALCulate:MARKer:PEAK:MULTi	none
Peak Search	Multi Peak Number	**MMPKN**	:CALCulate:MARKer:PEAK:MULTi:NUMber	<integer>|?
Peak Search	Multi Peak Trace	**MMPKT**	:CALCulate:MARKer:PEAK:MULTi:TRACe	<integer>|?
Mode	Mode	**MODE**	:INSTrument[:SELect]	SA|EMC|?
Peak Search	Peak Search	**MPK[1~9]**	:CALCulate:MARKer[1~9]:MAXinum	none
Peak Search	Peak Excursn	**MPKE**	:CALCulate:MARKer:PEAK:EXCursion	<amplitude>|?
Peak Search	Next Left Peak Search	**MPKL[1~9]**	:CALCulate:MARKer[1~9]:MAXinum:LEFT	none
Peak Search	Minimum Search	**MPKM[1~9]**	:CALCulate:MARKer[1~9]:MINinum	none
Peak Search	Next Peak Search	**MPKN[1~9]**	:CALCulate:MARKer[1~9]:MAXinum:NEXT	none
Peak Search	Peak to Peak Search	**MPKP[1~9]**	:CALCulate:MARKer[1~9]:PTPeak	none
Peak Search	Peak Parameter	**MPKPA**	:CALCulate:MARKer:PEAK:SEARch:MODE	MAX|PARameter|?
Peak Search	Next Right Peak Search	**MPKR[1~9]**	:CALCulate:MARKer[1~9]:MAXinum:RIGHt	none
Peak Search	Peak Threshold	**MPKTH**	:CALCulate:MARKer:PEAK:THReshold	<amplitude>|?
Marker	Marker State	**MS[1~9]**	:CALCulate:MARKer[1~9]:STATe	OFF|ON|0|1|?
Marker	Marker Trace	**MT[1~9]**	:CALCulate:MARKer[1~9]:TRACe	1|2|3|?
Marker	Marker Table	**MTB**	:CALCulate:MARKer:TABLe:STATe	OFF|ON|0|1|?
Preset	Preset	**PRST**	:SYSTem:PRESet	none
Bandwidth	Resolution Bandwidth	**RB**	[:SENSe]:BANDwidth|BWIDth[:RESolution]	<frequency>|?
Meas - Control	Reset Max/Min Hold	**RESETCISPR**		none
Amplitude	Reference Level	**RL**	:DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel	<amplitude>|?
Meas - Control	Repetition	**RTYPE**		SINGLE|CONTinuous|?
Meas - Control	Scan	**SCAN**	:MEASure:SCAN	RUN|HOLD|STOP|?
Amplitude	Scale/Divide	**SD**	:DISPlay:WINDow:TRACe:Y[:SCALe]:PDIVision	<amplitude>|?
Sweep	Single	**SI**	:INITiate[:IMMediate]	none
Meas - Control	Scan Info	**SINFO**		OFF|ON|0|1|?

Index	Description	SA Command	SCPI Command	Suffix
Span	Span	**SP**	[:SENSe]:FREQuency:SPAN	<frequency>|?
Frequency	CF Step	**SS**	[:SENSe]:FREQuency:CENTer:STEP[:INCRement]	<frequency>|?
Frequency	CF Step Auto	**SSA**	[:SENSe]:FREQuency:CENTer:STEP:AUTO	OFF|ON|0|1|?
Sweep	Sweep Time	**ST**	[:SENSe]:SWEep:TIME	<time>|?
Sweep	Sweep Time Auto	**STA**	[:SENSe]:SWEep:TIME:AUTO	OFF|ON|0|1|?
Mode - Setup	Config Type	**STYPE**		DFLT|MANL|?
Trace	Trace Data Format	**TDF**	:TRACe:FORMat	ASCii|REAL,64|INT,32|REAL,32|?
Display	Threshold Line Ampl	**TH**	:DISPlay:WINDow:TRACe:Y:TLINe	<amplitude>|?
Display	Threshold Line State	**THS**	:DISPlay:WINDow:TRACe:Y:TLINe:STATe	OFF|ON|0|1|?
Display	Title	**TITLE**	:DISPlay:ANNotation:TITLe:DATA	<string>|?
Mode - Setup	Max Range	**TRANGE**		<integer>|?
Trace	Query Trace Data	**TRD**	:TRACe[:DATA]	? TRACE1|TRACE2|TRACE3
Trace	Send/Query Trace Data	**TRD**	:TRACe[:DATA]	? TRACE1|TRACE2|TRACE3
Trace	Query Trace Data	**TRD**	:TRACe[:DATA]	? CISPR
Trace	Query Trace Data	**TRDF**	:TRACe[:DATA]:FREQuency	? TRACE1|TRACE2|TRACE3
Trace	Trace Function	**TRF[1~3]**	:TRACe[1~3]:MODE	WRITe|MAXHold|MINHold|VIEW| BLANK|?
Trigger	Trigger Slope	**TSL**	:TRIGger[:SEQuence]:SLOPe	POSitive|NEGative|?
Trigger	Trigger Source	**TSO**	:TRIGger[:SEQuence]:SOURce	IMMediate|EXTernal|?
Display	White Mode	**WH**	:DISPlay:WINDow:WHITe	OFF|ON|0|1|?
Span	Zoom In	**ZI**	[:SENSe]:FREQuency:SPAN:ZIN	none
Span	Zoom Out	**ZO**	[:SENSe]:FREQuency:SPAN:ZOUT	none

In order of SCPI command

Index	Description	SA Command	SCPI Command	Suffix
Common	*CLS	*CLS	***CLS**	none
Common	*ESE	*ESE	***ESE**	<integer>|?
Common	*ESR	*ESR	***ESR**	?
Common	*IDN	*IDN	***IDN**	?
Common	*OPC	*OPC	***OPC**	?
Common	*RST	*RST	***RST**	none
Common	*SRE	*SRE	***SRE**	<integer>|?
Common	*STB	*STB	***STB**	?
Limit Line	Pass/Fail Alarm	ALARM	**:CALCulate:LLINe:ALARM**	OFF|ON|0|1|?
Limit Line	Clear Limit Line	LLAO	**:CALCulate:LLINe:AOFF**	none
Limit Line	Limit Line Check State	LLCS[1~3]	**:CALCulate:LLINe[1~3]:CHECk:STATe**	OFF|ON|0|1|?
Limit Line	Limit Line Fail Count	LLFC[1~3]	**:CALCulate:LLINe[1~3]:FAIL:COUNt**	?
Marker	Marker All Off	MAO	**:CALCulate:MARKer:AOFF**	none
Peak Search	Peak Excursn	MPKE	**:CALCulate:MARKer:PEAK:EXCursion**	<amplitude>|?
Peak Search	Multi Peak	MMPK	**:CALCulate:MARKer:PEAK:MULTi**	none
Peak Search	Multi Peak Number	MMPKN	**:CALCulate:MARKer:PEAK:MULTi:NUMber**	<integer>|?
Peak Search	Multi Peak Trace	MMPKT	**:CALCulate:MARKer:PEAK:MULTi:TRACe**	<integer>|?
Peak Search	Peak Parameter	MPKPA	**:CALCulate:MARKer:PEAK:SEARch:MODE**	MAX|PARameter|?
Peak Search	Peak Threshold	MPKTH	**:CALCulate:MARKer:PEAK:THReshold**	<amplitude>|?
Marker	Marker Table	MTB	**:CALCulate:MARKer:TABLe:STATe**	OFF|ON|0|1|?
Peak Search	Peak Search	MPK[1~9]	**:CALCulate:MARKer[1~9]:MAXinum**	none
Peak Search	Next Left Peak Search	MPKL[1~9]	**:CALCulate:MARKer[1~9]:MAXinum:LEFT**	none
Peak Search	Next Peak Search	MPKN[1~9]	**:CALCulate:MARKer[1~9]:MAXinum:NEXT**	none
Peak Search	Next Right Peak Search	MPKR[1~9]	**:CALCulate:MARKer[1~9]:MAXinum:RIGHt**	none
Peak Search	Minimum Search	MPKM[1~9]	**:CALCulate:MARKer[1~9]:MINinum**	none
Marker	Marker Mode	MM[1~9]	**:CALCulate:MARKer[1~9]:MODE**	POSition|DELTa|OFF|?
Peak Search	Peak to Peak Search	MPKP[1~9]	**:CALCulate:MARKer[1~9]:PTPeak**	none
Marker	Marker State	MS[1~9]	**:CALCulate:MARKer[1~9]:STATe**	OFF|ON|0|1|?
Marker	Marker Trace	MT[1~9]	**:CALCulate:MARKer[1~9]:TRACe**	1|2|3|?
Marker	Marker Freq	MF[1~9]	**:CALCulate:MARKer[1~9]:X**	<frequency>|?
Marker	Marker Amplitude	MA[1~9]	**:CALCulate:MARKer[1~9]:Y**	?
Display	Title	TITLE	**:DISPlay:ANNotation:TITLe:DATA**	<string>|?
Display	Full Screen	FSCR	**:DISPlay:FSCReen[:STATe]**	OFF|ON|0|1|?
Display	Graticule	GRAT	**:DISPlay:WINDow:TRACe:GRATicule:GRID [:STATe]**	TYPE1|TYPE|OFF|?
Display	Display Line Ampl	DL	**:DISPlay:WINDow:TRACe:Y:DLINe**	<amplitude>|?
Display	Display Line State	DLS	**:DISPlay:WINDow:TRACe:Y:DLINe:STATe**	OFF|ON|0|1|?
Display	Threshold Line Ampl	TH	**:DISPlay:WINDow:TRACe:Y:TLINe**	<amplitude>|?
Display	Threshold Line State	THS	**:DISPlay:WINDow:TRACe:Y:TLINe:STATe**	OFF|ON|0|1|?

Index	Description	SA Command	SCPI Command	Suffix
Amplitude	Scale/Divide	SD	**:DISPlay:WINDow:TRACe:Y[:SCALe]:PDIVision**	<amplitude>|?
Amplitude	Reference Level	RL	**:DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel**	<amplitude>|?
Display	White Mode	WH	**:DISPlay:WINDow:WHITe**	OFF|ON|0|1|?
Printer	Hard Copy	HCOPY	**:HCOPy[:IMMediate]**	none
Sweep	Continuous	CO	**:INITiate:CONTinuous**	OFF|ON|0|1|?
Sweep	Single	SI	**:INITiate[:IMMediate]**	none
Mode	Mode	MODE	**:INSTrument[:SELect]**	SA|EMC|?
Meas - Control	Scan	SCAN	**:MEASure:SCAN**	RUN|HOLD|STOP|?
Measurement	Meas. Start	MEA	**:MEASure:STARt**	SCAN|DEBUG|CISPR|?
File	Read	FREAD	**:MMEMory:CATalog**	? <`directory_name'>
File	Copy	FCOPY	**:MMEMory:COPY**	<`file_name1'>,<`file_name2'>
File	Move	FMOVE	**:MMEMory:DATA**	<`file_name'>,definite_length|? <'file_name>
File	Delete	FDEL	**:MMEMory:DELete**	<`file_name'>
File	Load	FLOAD	**:MMEMory:LOAD**	<`file_name'>
File	Rename	FRENAME	**:MMEMory:MOVE**	<`file_name1'>,<`file_name2'>
File	Save	FSAVE	**:MMEMory:STORe**	<`file_name'>
Others	Error Code	ERR	**:SYSTem:ERRor[:NEXT]**	?
Preset	Preset	PRST	**:SYSTem:PRESet**	none
Trace	Trace Data Format	TDF	**:TRACe:FORMat**	ASCii|REAL,64|INT,32| REAL,32|?
Trace	Query Trace Data	TRD	**:TRACe[:DATA]**	? TRACE1|TRACE2|TRACE3
Trace	Send/Query Trace Data	TRD	**:TRACe[:DATA]**	? TRACE1|TRACE2|TRACE3
Trace	Query Trace Data	TRD	**:TRACe[:DATA]**	? CISPR
Trace	Query Trace Data	TRDF	**:TRACe[:DATA]:FREQuency**	? TRACE1|TRACE2|TRACE3
Trace	Trace Function	TRF[1~3]	**:TRACe[1~3]:MODE**	WRITe|MAXHold|MINHold| VIEW|BLANK|?
Trigger	Trigger Slope	TSL	**:TRIGger[:SEQuence]:SLOPe**	POSitive|NEGative|?
Trigger	Trigger Source	TSO	**:TRIGger[:SEQuence]:SOURce**	IMMediate|EXTernal|?
Amplitude	Amplitude Units	AU	**:UNIT:POWer**	DBM|DBMV|DBMA|V|W|A| DBUV|DBUA|?
Bandwidth	Resolution Bandwidth	RB	**[:SENSe]:BANDwidth|BWIDth[:RESolution]**	<frequency>|?
Amplitude	Delete All Corrections	COAD	**[:SENSe]:CORRection:CSET:ALL:DELete**	none
Amplitude	Apply Corrections	COAS	**[:SENSe]:CORRection:CSET:ALL[:STATe]**	OFF|ON|0|1|?
Amplitude	Correction State	COA1|2|3|4	**[:SENSe]:CORRection:CSET1|2|3|4[:STATe]**	OFF|ON|0|1|?
Frequency	Center Frequency	CF	**[:SENSe]:FREQuency:CENTer**	<frequency>|?
Frequency	CF Step Auto	SSA	**[:SENSe]:FREQuency:CENTer:STEP:AUTO**	OFF|ON|0|1|?
Frequency	CF Step	SS	**[:SENSe]:FREQuency:CENTer:STEP[:INCRement]**	<frequency>|?
Span	Span	SP	**[:SENSe]:FREQuency:SPAN**	<frequency>|?
Span	Full Span	FS	**[:SENSe]:FREQuency:SPAN:FULL**	none
Span	Last Span	LS	**[:SENSe]:FREQuency:SPAN:PREVious**	none
Span	Zoom In	ZI	**[:SENSe]:FREQuency:SPAN:ZIN**	none
Span	Zoom Out	ZO	**[:SENSe]:FREQuency:SPAN:ZOUT**	none
Frequency	Start Frequency	FA	**[:SENSe]:FREQuency:STARt**	<frequency>|?
Frequency	Stop Frequency	FB	**[:SENSe]:FREQuency:STOP**	<frequency>|?
Amplitude	Attenuation	AT	**[:SENSe]:POWer[:RF]:ATTenuation**	<amplitude>|?

Index	Description	SA Command	SCPI Command	Suffix
Amplitude	Attenuation Auto	ATA	**[:SENSe]:POWer[:RF]:ATTenuation:AUTO**	OFF|ON|0|1|?
Amplitude	Internal Amplifier	IA	**[:SENSe]:POWer[:RF]:GAIN[:STATe]**	OFF|ON|0|1|?
Sweep	Sweep Time	ST	**[:SENSe]:SWEep:TIME**	<time>|?
Sweep	Sweep Time Auto	STA	**[:SENSe]:SWEep:TIME:AUTO**	OFF|ON|0|1|?

Appendix B
ERROR CODES

Code	Description
990	Not supported in current mode
991	Not installed (option)
992	System is busy
993	Execution error (EXE)
994	Query error (QYE)
995	Suffix error
996	Input data size over error
997	Undefined command
998	Unnecessary suffix insertion
999	Undefined suffix

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1. DEFINITIONS

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Aeroflex Limited, Longacres House, Six Hills Way, Stevenage, SG1 2AN, UK.

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