



SPECTRUM ANALYZERS

3280A Series



EMI Receiver User Manual

Document part no. 47090/023



SPECTRUM ANALYZERS

3280A SERIES

EMI Receiver

User Manual

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Manual part no. 47090/023 (PDF version)
Based on Issue 1 of the printed manual

20 November 2009

About this manual

This manual explains how to use the EMI Receiver option for the 3280A 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 that lists 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

- **3280A Series Operating Manual**
(PDF version 47090/011, printed version 47000/011)

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Precautions

This document is intended to be used in conjunction with the 3280A 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

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General

This section outlines the 3280A Series spectrum analyzer (the ‘instrument’) and details the optional accessories and the instrument’s specifications.

This option provides for conducted emission measurements of commercial electrical/electronic products. This user manual describes the system setup method for EMI measurement, and the operation of each menu.

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

Licensing the EMI receiver software

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

If your analyzer came with the EMI measurement 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

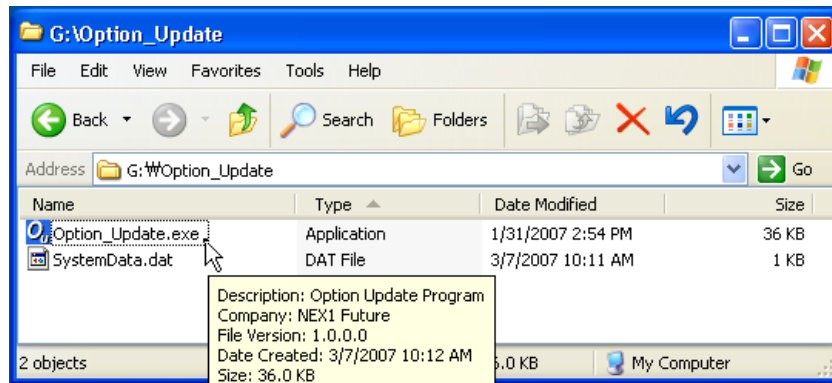
- 1 Connect keyboard and mouse to the PS2 ports or the USB ports.
- 2 Turn on the signal analyzer. Wait until the analyzer completes the power-up sequence.
- 3 Press System, Option Info., Option Activate.
- 4 Select the “EMI RECEIVER” field in the license active dialog window.

Note: all purchased options must be selected.

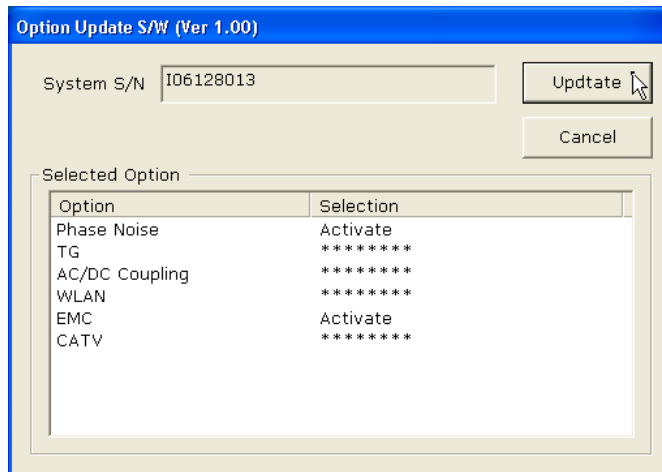
- 5 Enter the letters/digits of your 32-character license code using the mouse or the keyboard. The license key number is a hexadecimal number.
- 6 Press Activate.
- 7 Licensing is successfully completed when the “Activation Success” dialog window is displayed. If “Invalid License!” is displayed, enter the correct license code again.
- 8 Press OK or any key to exit from 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 serial number and authentication options, then click **Update**.
- 6 If the update has been successful, the **Cancel** button is replaced with **Done**.
- 7 Press **Done**.
- 8 Double-click the signal analyzer desktop shortcut icon to restart the main program.

Chapter 2

MENU TREE

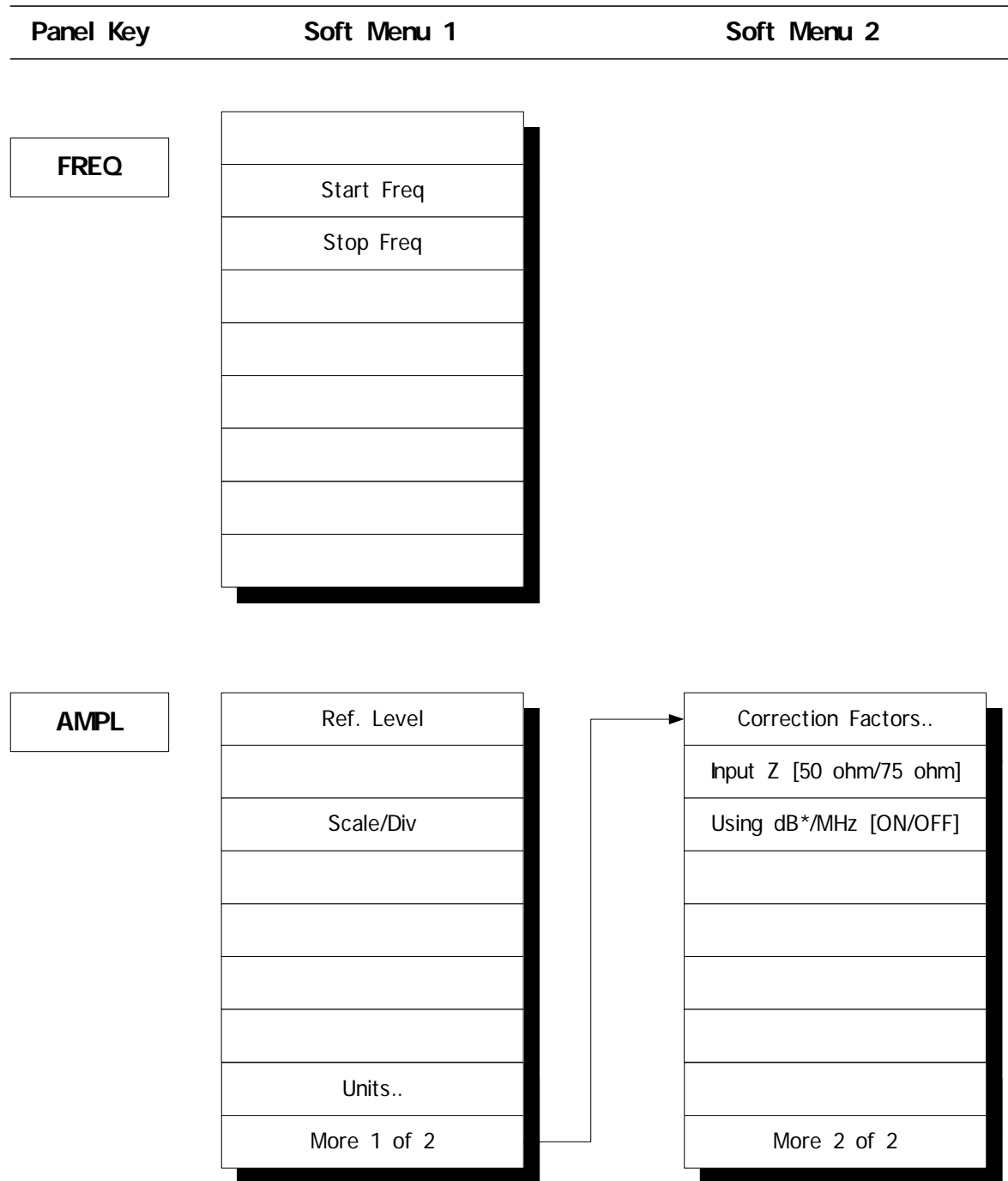
Introduction

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

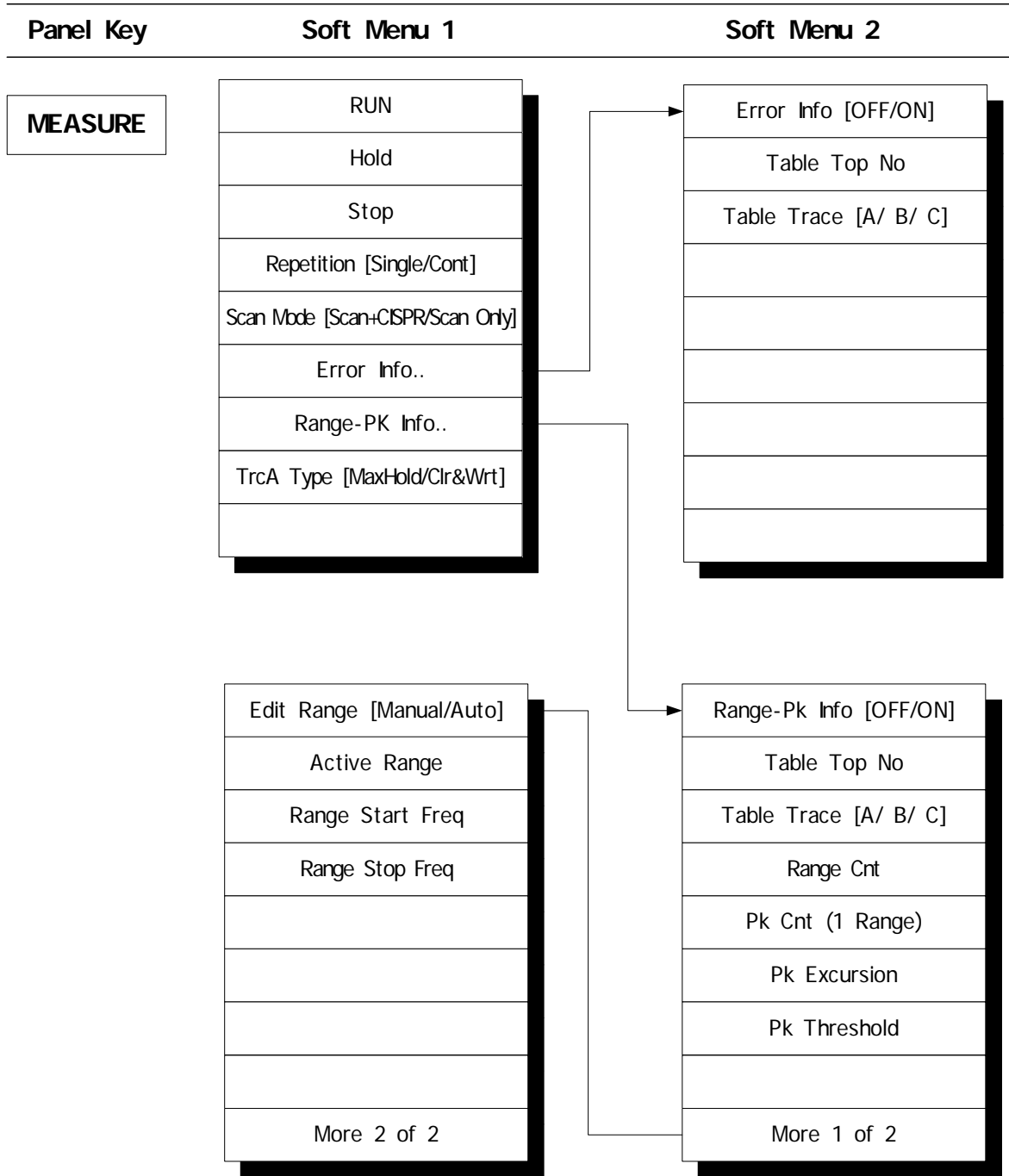
Note the following general operational points about the menu tree:

- **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.

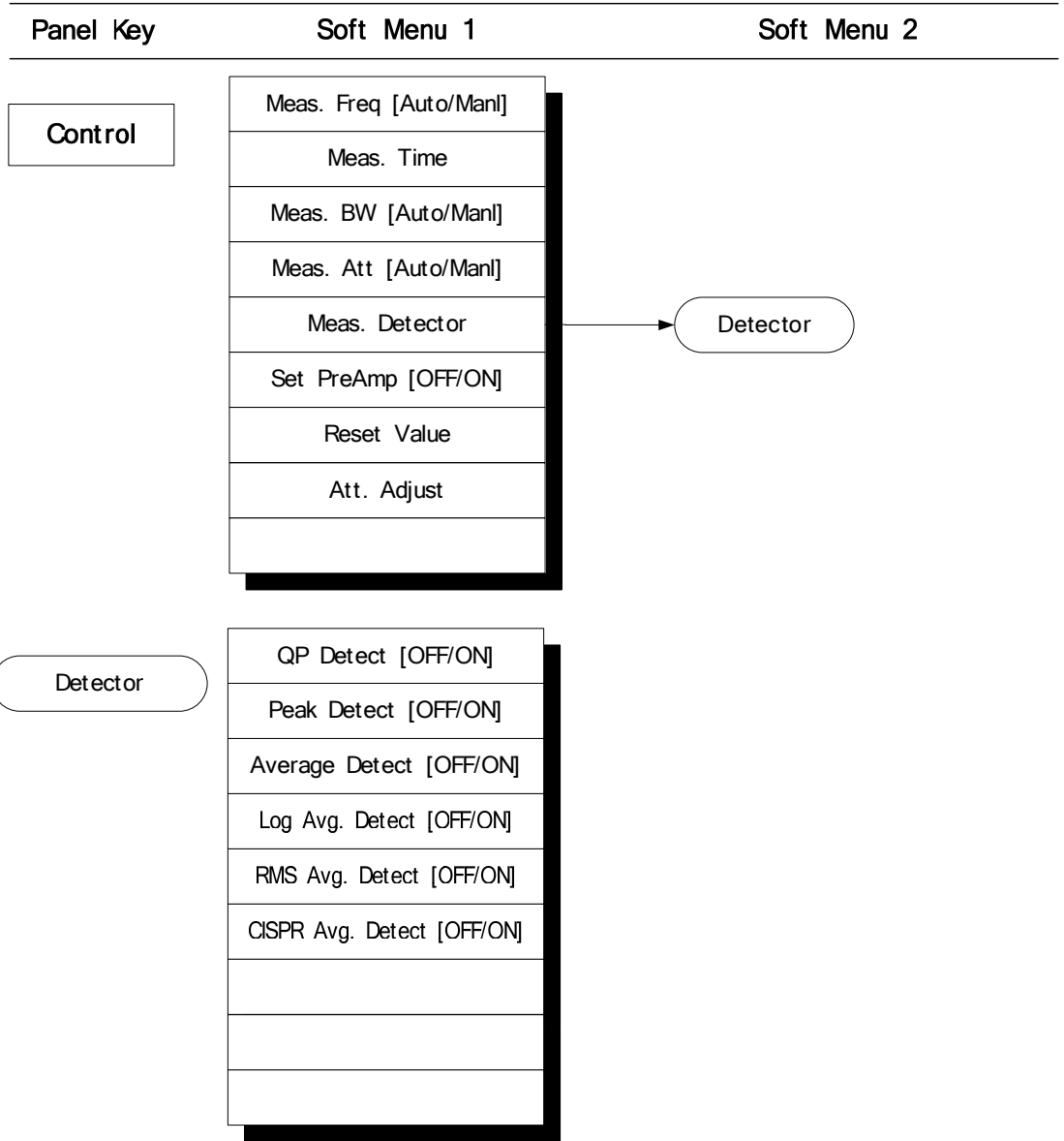
Menu tree



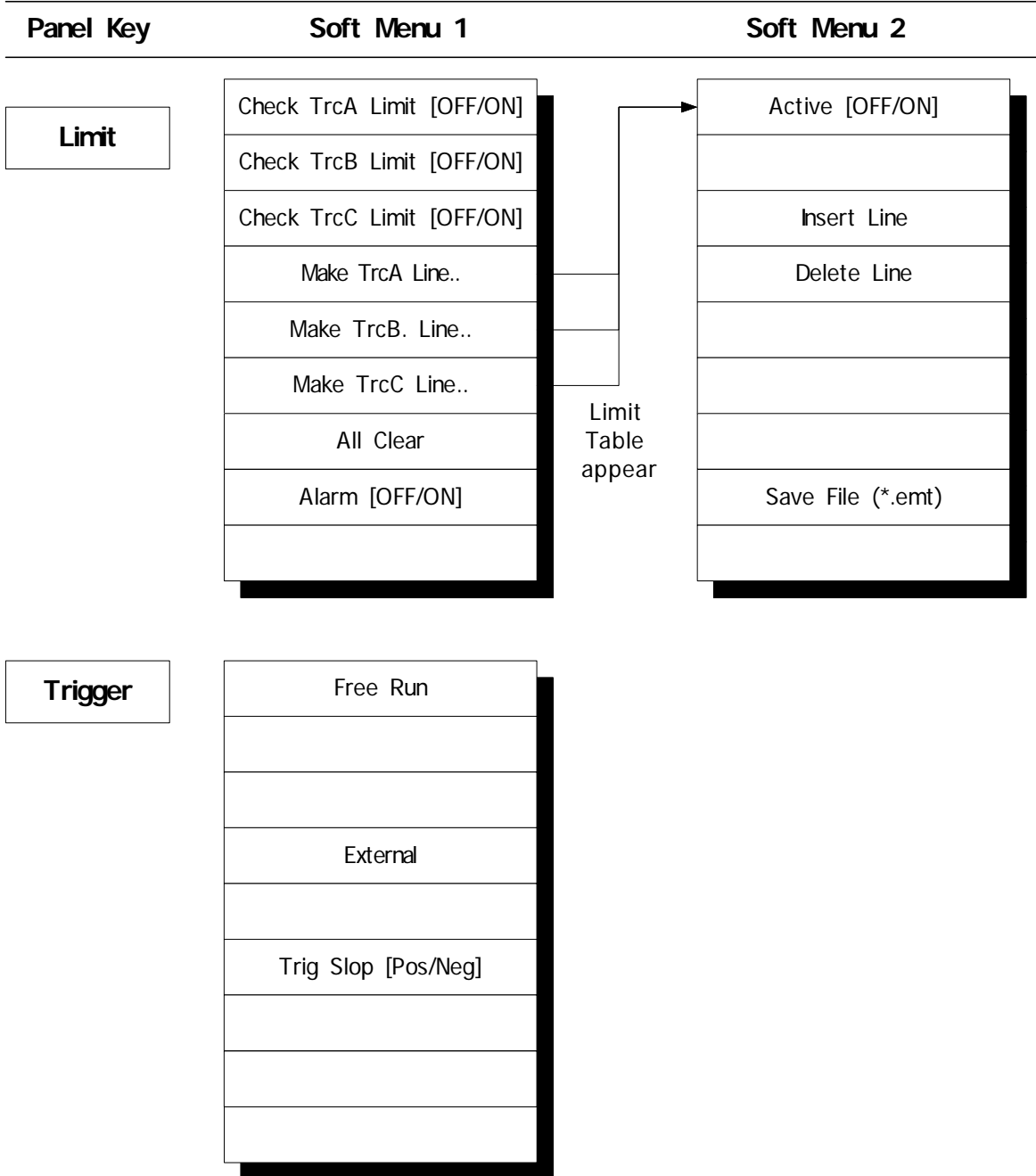
MENU TREE



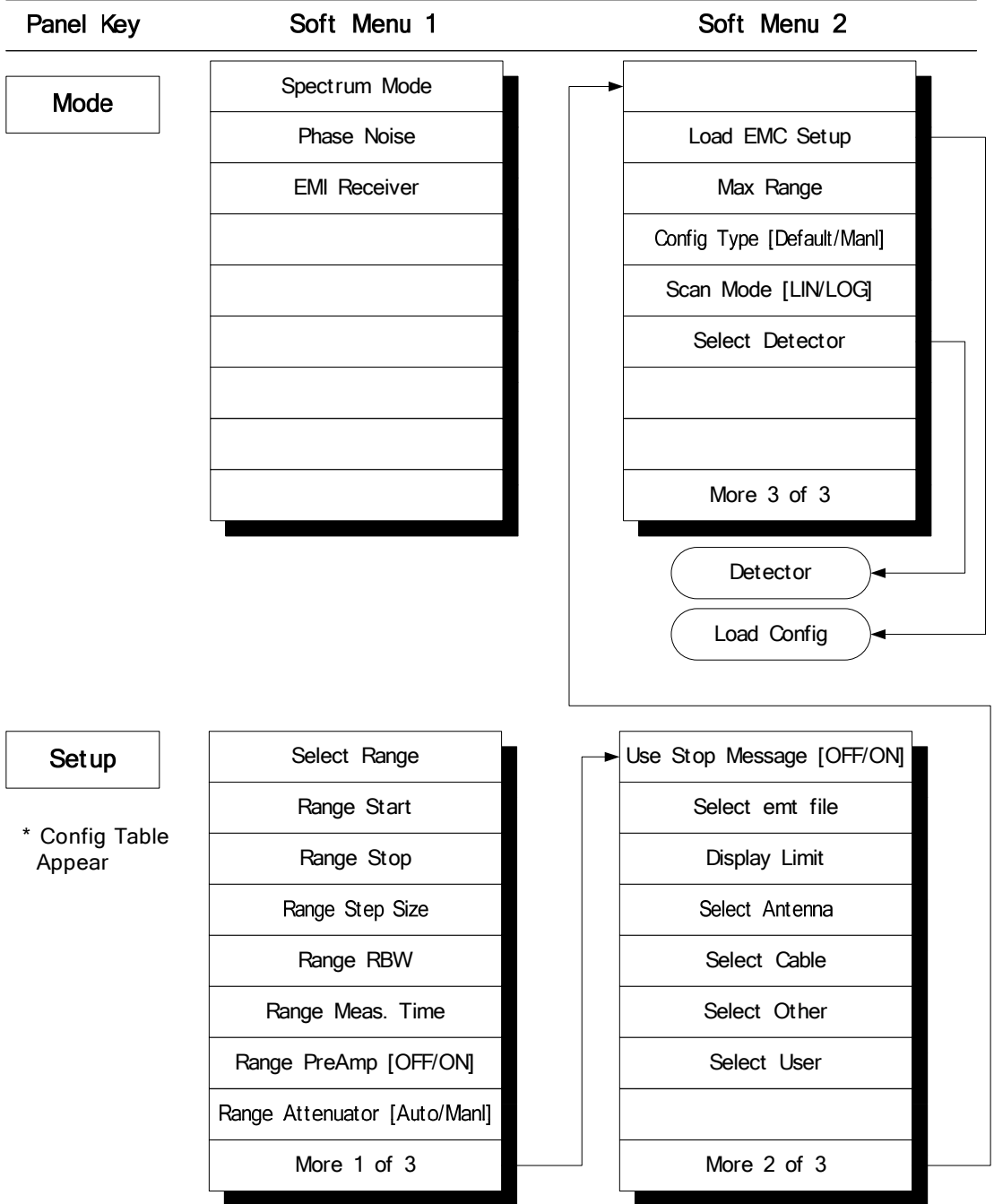
MENU TREE



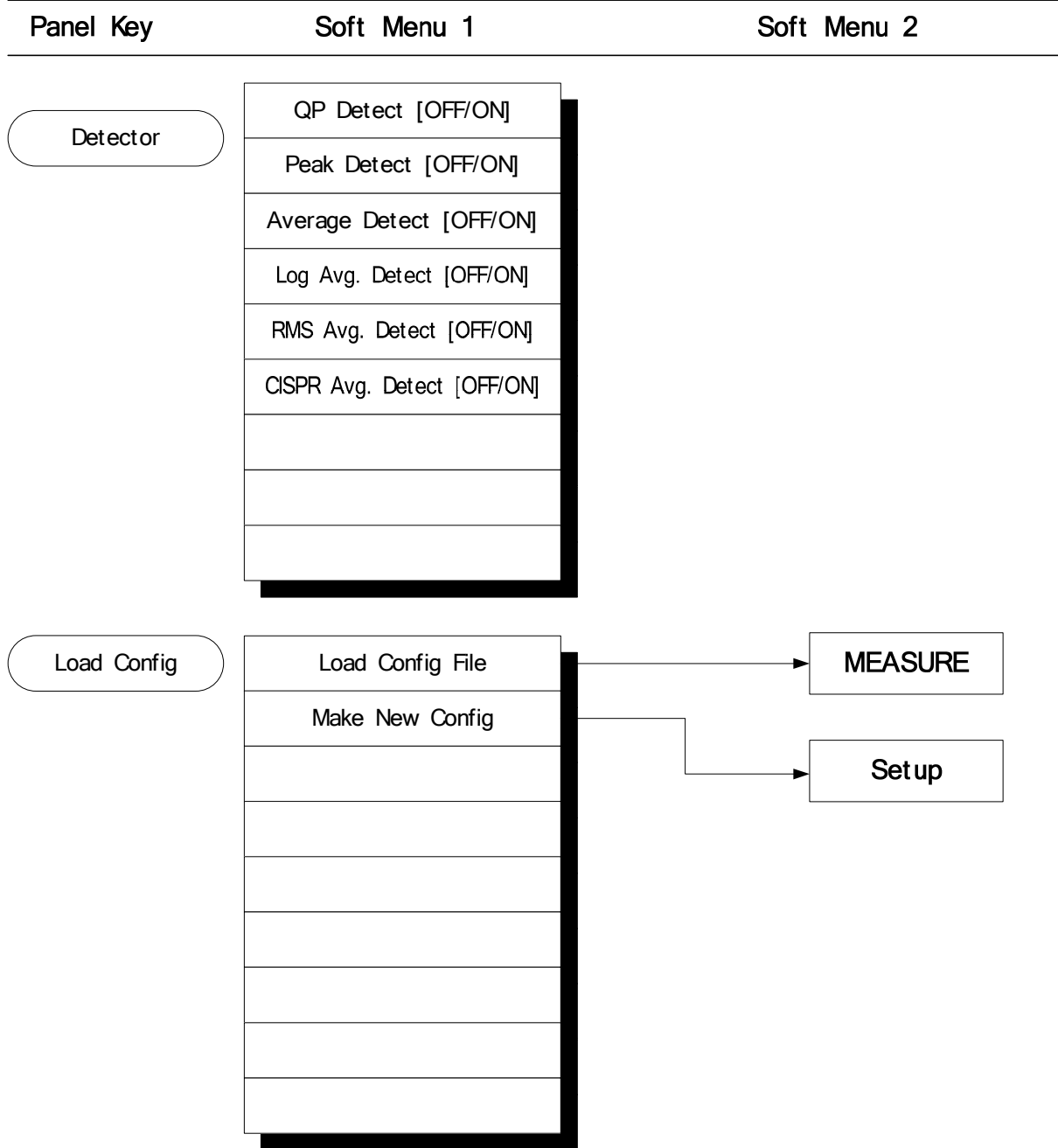
MENU TREE



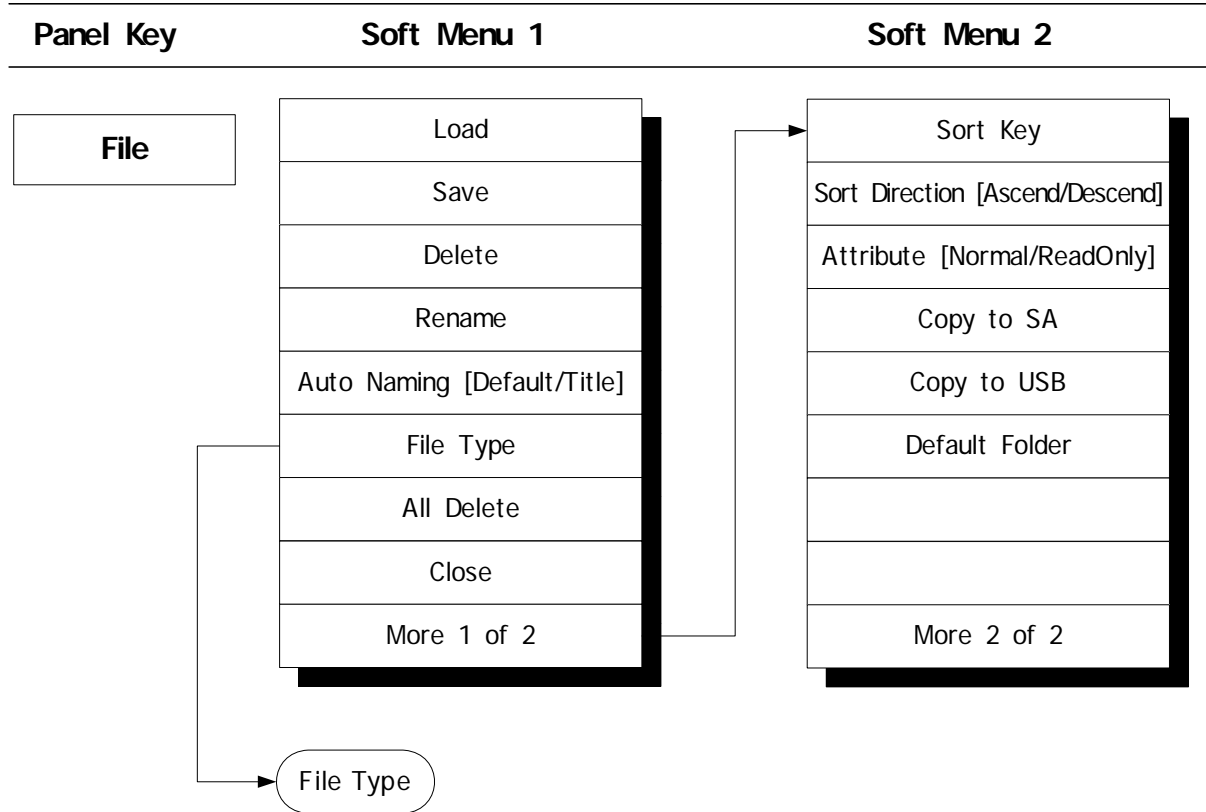
MENU TREE



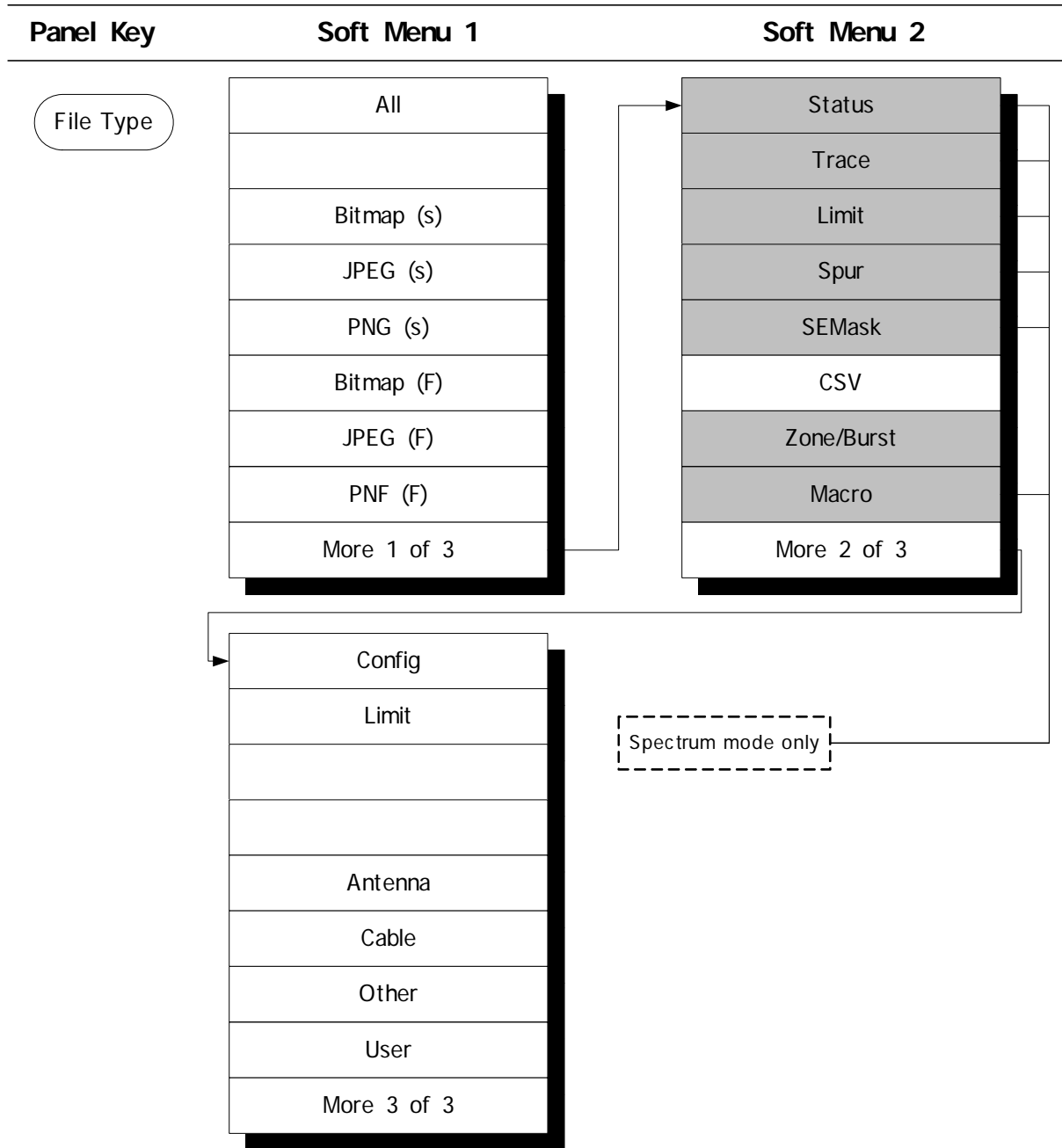
MENU TREE



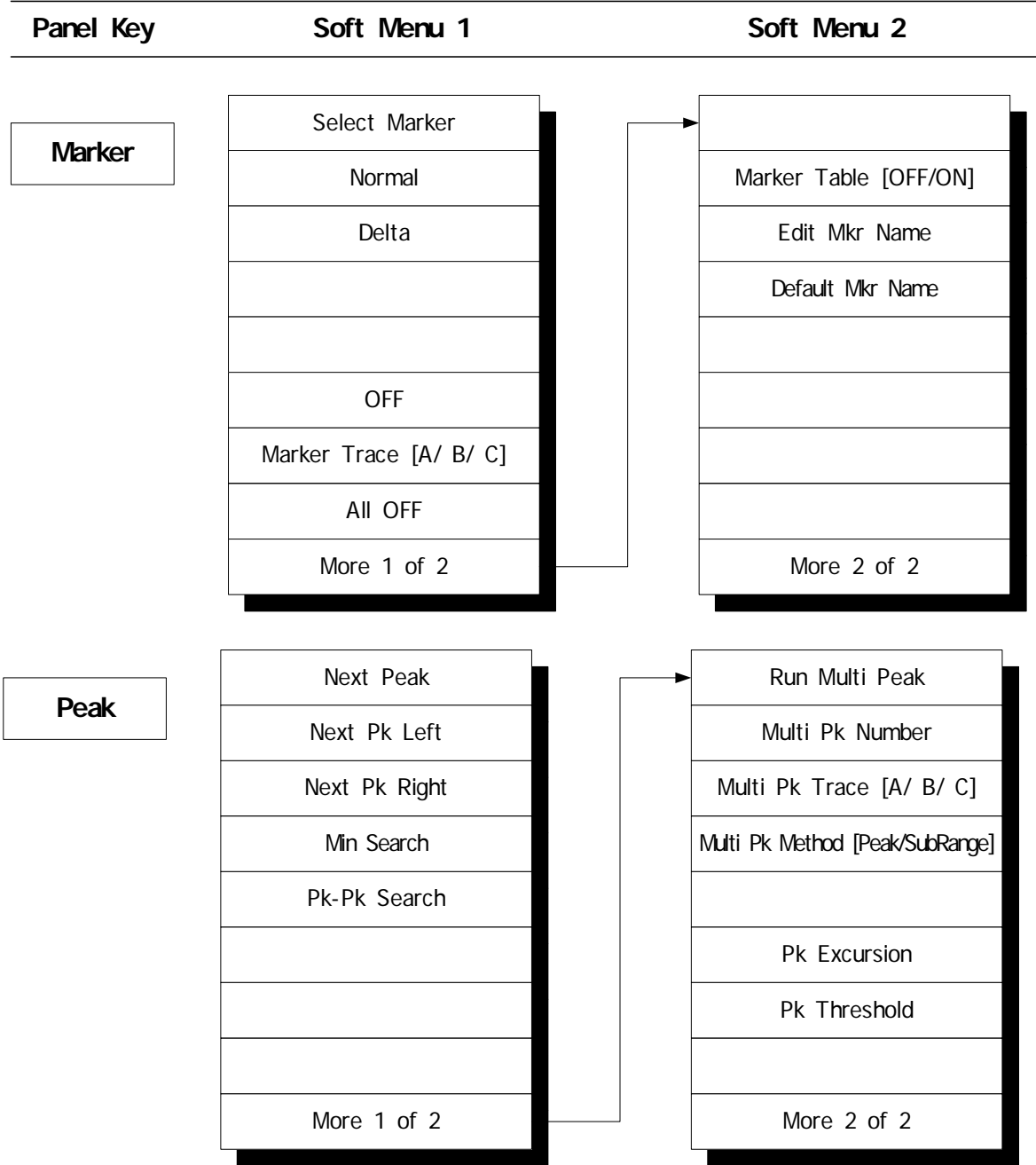
MENU TREE



MENU TREE



MENU TREE



Chapter 3 MENU DESCRIPTION

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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 corresponds 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

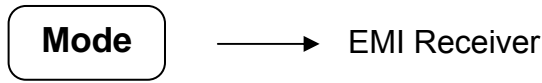
Hard key	Keyboard	Hard key	Keyboard	Hard key	Keyboard
FREQ	FR	Display	DI	BW	BW
SPAN	SP	Trace	TRA	AUX	AU
AMPL	AM	Trigger	TRI	Source	SO
MEASURE	ME	Limit	LI	Sweep	SW
Control	CON	Couple	COU	System	SY
Preset	PRE	Func	FU	Help	HE
File	FI	Save	SA	Print	PRI
Marker	MA	Single	SI	Peak	PE
Mkr >	MK				

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

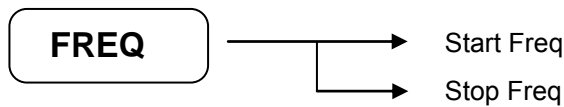
You need to switch the instrument to EMI Receiver mode to use its EMI measurement capability.



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.

Frequency menu

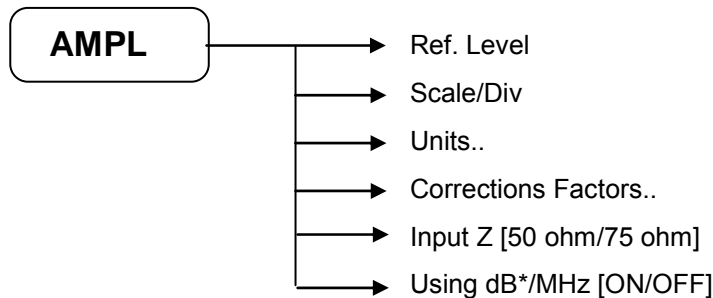
The frequency setting menu is displayed for a scan measurement. Start/Stop frequencies must be within the frequency range set in Range in the [Config dialog](#).



Start Frequency	Sets the start frequency.
Stop Frequency	Sets the stop frequency.

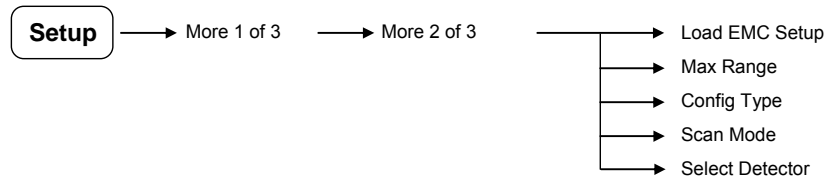
Amplitude menu

The amplitude setting menu is displayed.



Ref. Level	Sets the reference level.
Scale/Div	Sets the grid spacing of the y-axis.
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.
Using dB*/MHz	Changes the measured level to a normalized level according to the impulse bandwidth.

Setup menu



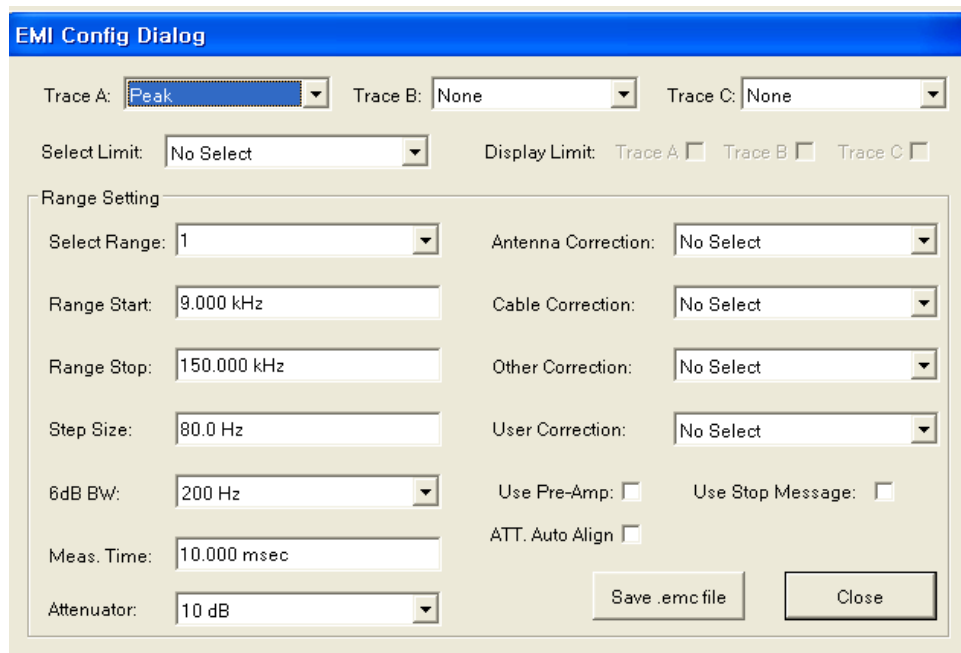
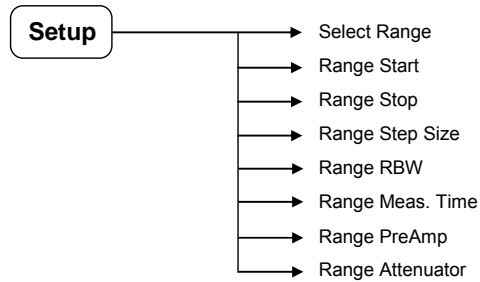
Load EMC Setup	Lets you load an existing configuration (.emc) file or create a new one.
Max Range	Sets the number of ranges (from one to six).
Config Type	Selects Default, which uses the system settings, or ManI, which lets you set the values.
Scan Mode	Designates the X axis as a linear or log scale.
Select Detector	Positive, Average, Quasi-peak, Log Average, RMS Average and CISPR Average detection modes can be set ON or OFF.

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.

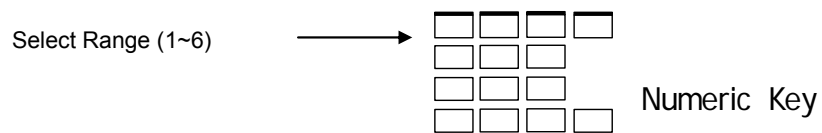
Set sub-range

Each measurement range has a sub-range of settings that can be set up differently for each range. To set the sub-range, press **[Setup]** and display the EMI Config Dialog window.



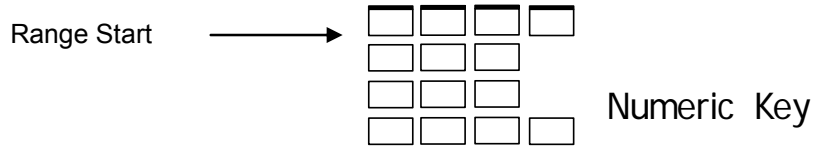
Select Range

Select the range you want to change:



Range Start

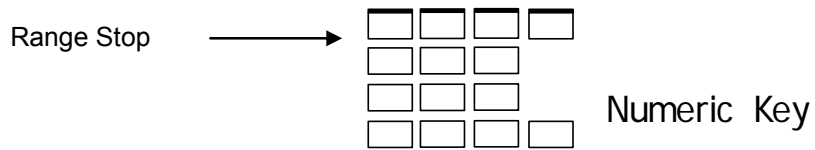
Choose the start frequency for this range.



In EMI Receiver mode, available frequencies are 10 Hz–3 GHz/13.2 GHz/26.5 GHz.

Range Stop

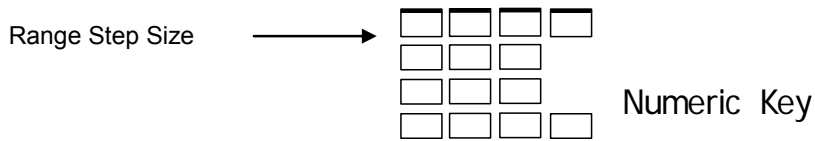
Choose the stop frequency for this range.



In EMI Receiver mode, the available frequencies are 20 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).

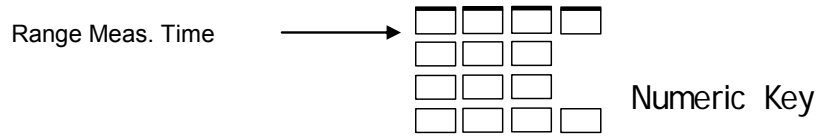
Range RBW

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

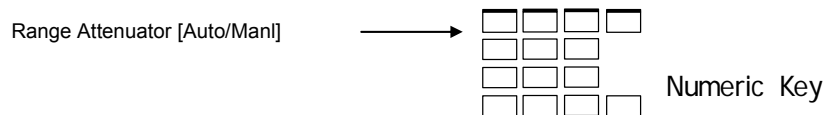
The signal analyzer has a built-in pre-amp that is usable from 1 MHz to 3 GHz. You can select whether to use the pre-amp.

Range PreAmp [OFF/ON]

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

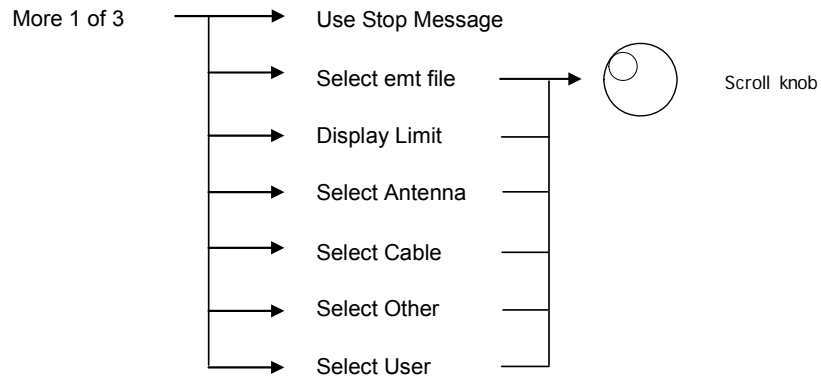
Range Attenuator

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.

Set stop message, limits and correction data



Use Stop Message

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



Select emt file/Display Limit

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

Press the Select emt file key and select the desired limit file using the scroll knob. Press Display Limit to display the limit line about the desired detector for the screen.

See [Limit menu](#) 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.

Sub-range correction data

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

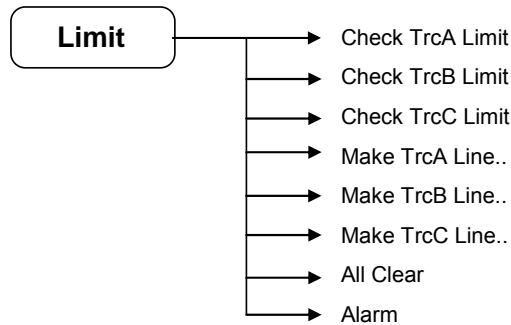
Use these keys to apply each correction factor.

Note: refer to the 3280A Series Operating Manual 47090/011, '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 8192 points available, and you can save a maximum of 1000000 files for each factor.

Limit menu

This key lets you set up and enable limit lines for each sub-range.

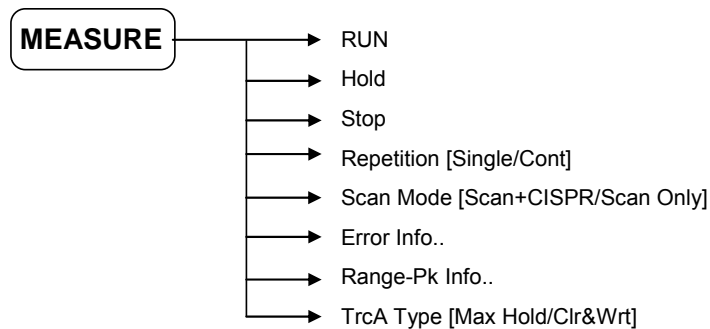


Check TrcA/B/C Limit	Enables/disables the limit line.
Make TrcA/B/C Line..	Lets you define limit lines for each sub-range, and save them as <i>.emt</i> files.
All Clear	Clears all limit lines.
Alarm	Displays an alert if a signal exceeds a limit line.

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

Measure menu

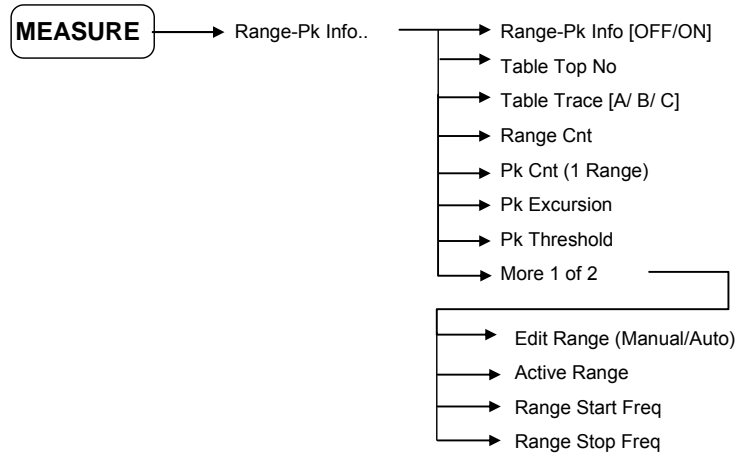
This key controls scan operation.



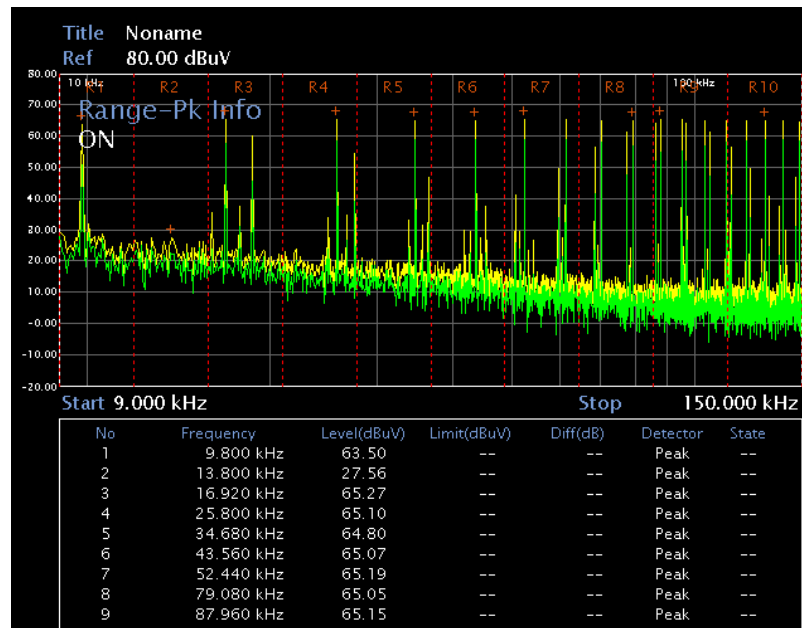
RUN	Scans from start frequency to stop frequency.
Hold	Ongoing action is temporarily held. To resume, press the RUN key.
Stop	Stops the scanning action.
Repetition	Selects whether to repeat the entire range.
Screen Mode	Selects Screen Mode. In CISPR+Scan mode, it changes to CISPR mode after finishing a scan measurement.
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.
TrcA Type	In the case of a continuous scan measurement, holds the maximum level of Trace A when TrcA Type is Max Hold.

Display the peak in a certain area

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



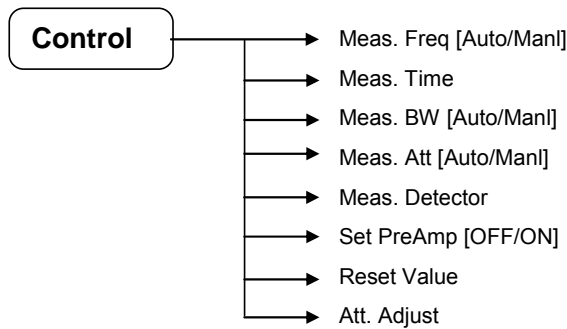
Range-Pk Info	Displays range-peak information on the screen.
Table Top No	Displays selected point on table.
Table Trace	Selects the trace for display.
Range Cnt	Sets the maximum range number to display.
Pk Cnt	Sets the maximum number of peaks to find in each range.
Pk Excursion	Sets the minimum amplitude variation of signals that the marker can identify as a peak.
Pk Threshold	Sets a lower boundary to the active trace.
Edit Range	You can modify the frequency of the range when Man1 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.

Control menu

Use the following to measure CISPR level when scan measurement is stopped.



Meas. Freq	Sets the frequency to measure. In the case of Auto mode, set to the frequency of the marker. Also, set to the last frequency when the scan measurement is finished.
Meas. Time	Sets the measure time for each point. At QP detection, if you want to make accurate measurements, this needs to be above 1 s.
Meas. BW	Selects the 6 dB filter to measure.
Meas. Att	Selects the attenuator to measure. If you select 'Auto', the attenuator changes according to the input signal.
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.
Reset Value	Resets Max/Min level to the current level.
Att. Adjust	The attenuator adjusts according to the current input signal.

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

Limitations

The following keys are not available in EMI Receiver mode:

[SPAN[, [In/Out], [Trace], [Couple], [BW], [AUX], [Tune], [Mkr >], [Func], [Sweep], [Single]

Chapter 4

MAKING EMI RECEIVER MEASUREMENTS

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EMI receiver measurements

When you run a scan measurement, the instrument operates in Scan mode. When a scan measurement is not running, the instrument operates in CISPR 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.

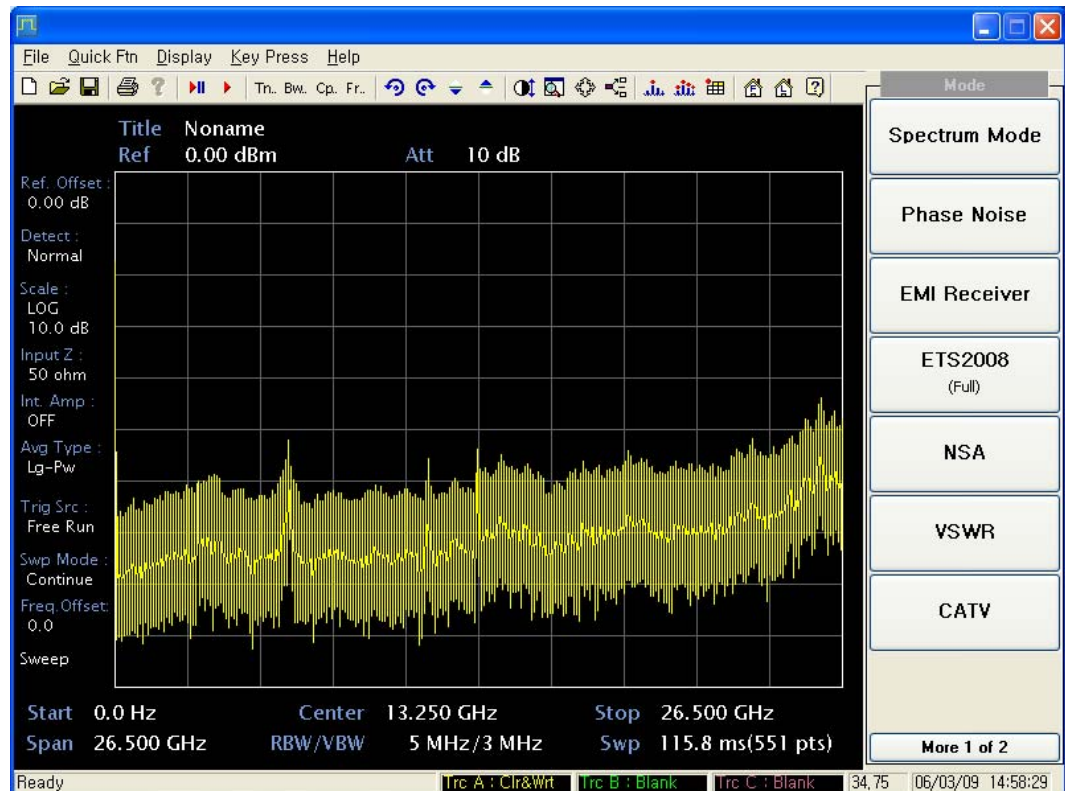
The instrument can measure three types (positive, average, quasi-peak) of detector at once, and display results on the screen. Trace A becomes positive, Trace B becomes average or RMS average, and Trace C becomes quasi peak, log average, or CISPR average detector. You can set up a limit line by detector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

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

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 select EMI receiver mode by pressing the [EMI Receiver] key.



EMI RECEIVER MEASUREMENTS

- 2 When you change from Spectrum mode to EMI Receiver mode, CISPR mode is running. 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 [Reset Value], the table is reset to the current value.
- 4 CISPR measurement runs when a scan measurement is not running.

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

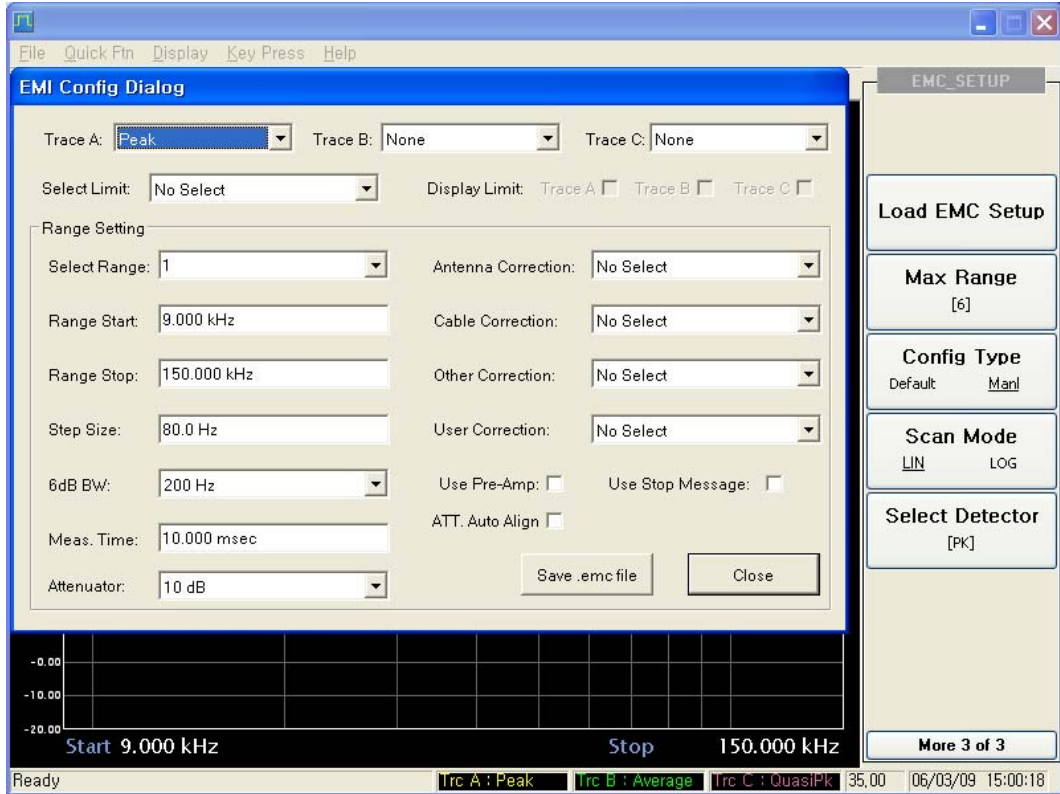
If you set [Meas. BW] to Auto, the BW filter changes according to what you set in [Meas. Freq].

Scan measurement methods (example)

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

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

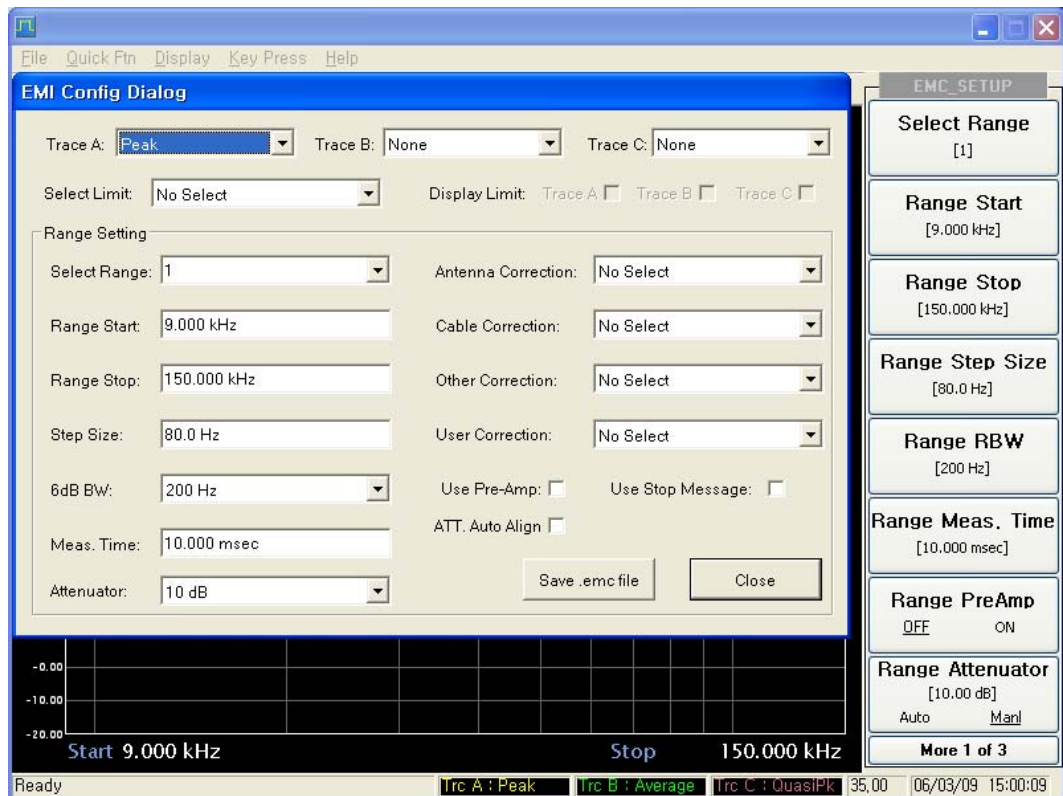
- 1 To enter EMI Receiver mode, press [Setup], [More 1 of 3], [More 2 of 3] and the EMC Config Dialog menu is displayed.



- 2 Multiple ranges of the target are measured in SCAN mode. Details for each sub-range can be set up. Possible parameters for setting are as follows.
 - Range Start frequency: the start frequency for the range.
 - Range Stop frequency: the stop frequency for the range.
 - Range Step size: the intervals between frequency steps.
 - Range Measurement Time: the time intervals between measurements.
 - 6dB IF BW Filter: sets the IF BW filter.
 - Pre-Amplifier: select whether the internal amplifier is used.
 - Attenuator: select the attenuator value.
 - Use Stop Message: select whether a stop message is displayed.
 - Corrections (Antenna, Cable, Other, User Factor): each file is used to correct the amplitude of a particular parameter.

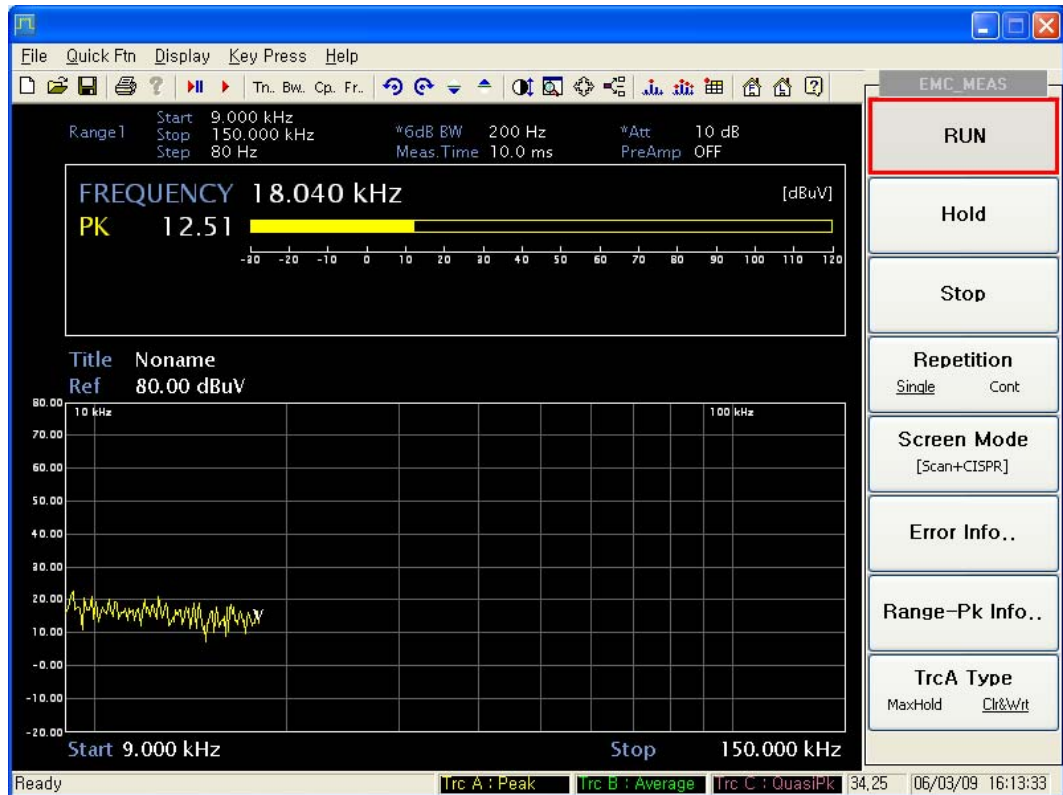
In order to adjust the settings in detail, press the [Setup] key. To use limit functions, use the limit files in the limit table feature.

EMI RECEIVER MEASUREMENTS



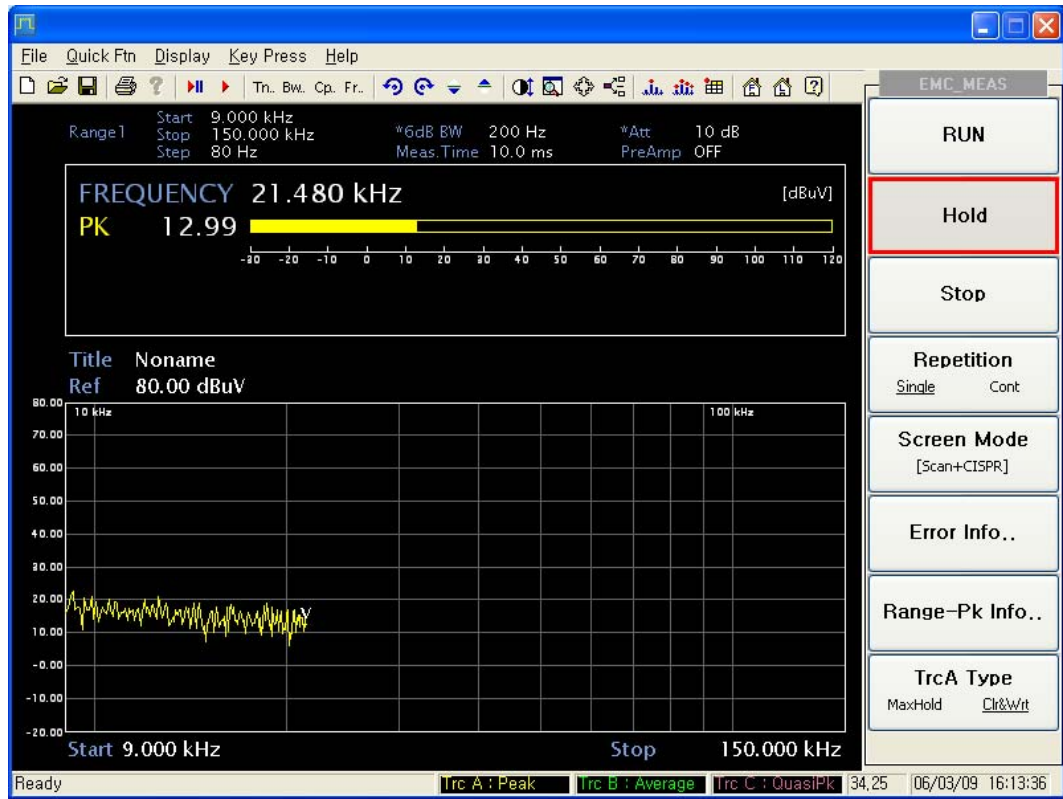
- 3 Set the actual start and stop frequencies after pressing **[FREQ]**. To display the measurement menu, press **[MEASURE]**. Start the scan by pressing **[RUN]**.

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



You can see how the measurement is progressing. If you want to pause the measurement, press **[Hold]**.

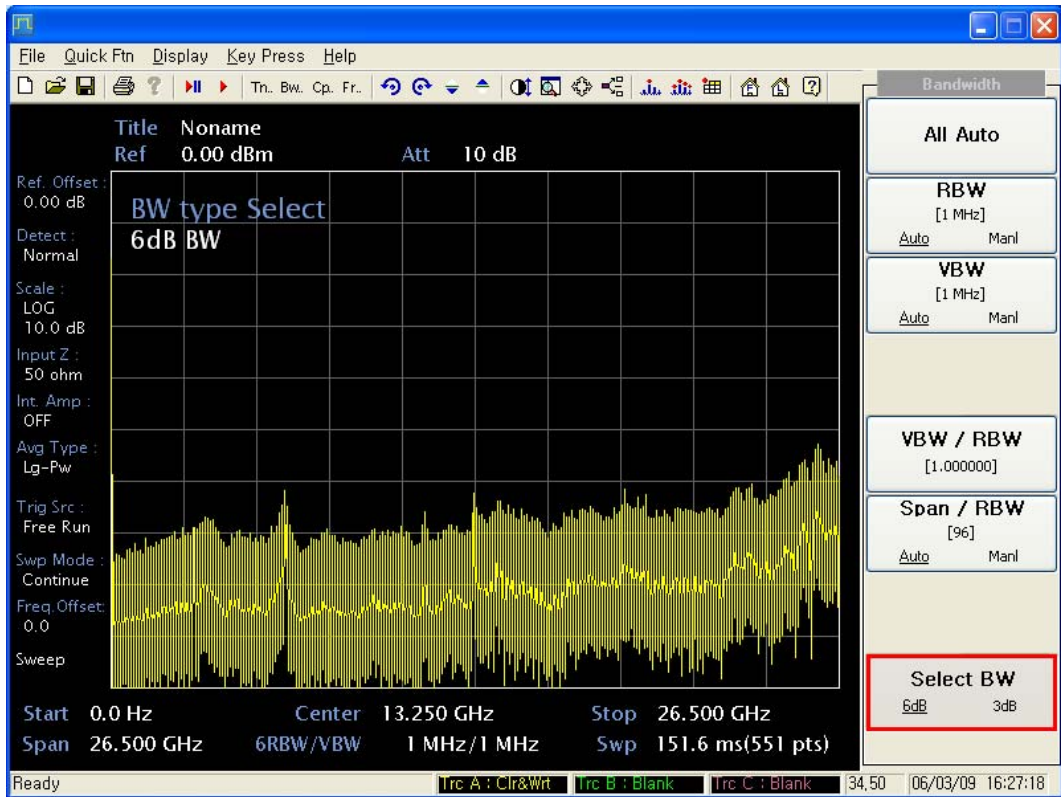
EMI RECEIVER MEASUREMENTS



Press [RUN] again to restart the scan measurement.

Spectrum measurement method (example)

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



In the *[Select BW]* menu, you can switch BW to 3 dB or 6 dB.

Chapter 5

DETAILED DESCRIPTION OF COMMANDS

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General description

This section gives detailed descriptions of the device messages for the spectrum analyzer in functional order. 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	80 dBuV
Example	RL 0; RL 80 DBUV; RL ?; DISP:WIND:TRAC:Y:RLEV 0; DISP:WIND:TRAC:Y:RLEV 80 DBUV; DISP:WIND:TRAC:Y:RLEV?;

SD

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

	Scale/Divide
Function	Sets the scale/divide value.
Remote Command	SDΔf
	SD?
	:DISPlay:LPLot:WINDow:TRACe:Y[:SCALe]:PDIVisionΔf
	:DISPlay:LPLot:WINDow:TRACe:Y[:SCALe]:PDIVision?
Response Message	Scale/Divide (dB/div)
Value of f	0.1 dB 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	AUΔsw AU? :UNIT:POWerΔsw :UNIT:POWer?	
Response Message	DBM	: dBm
	DBUV	: dBuV
	DBUA	: dBuA
	DBUVM	: dBuV/m
	DBUAM	: dBuA/m
	DBMV	: dBmV
	DBMA	: dBmA
	DBPW	: dBpW
	DBPT	: dBpT
	V	: V
	W	: W
	A	: A
Value of sw	None	: dBm
	DBUV	: dBuV
	DBUA	: dBuA
	DBUVM	: dBuV/m
	DBUAM	: dBuA/m
	DBMV	: dBmV
	DBMA	: dBmA
	DBPW	: dBpW
	DBPT	: dBpT
	V	: V
	W	: W
	A	: A
Initial setting	DBM	
Example	AU DBM; AU? UNIT:POW DBM; UNIT:POW?;	

CFEDIT[1~4]

Edit Correction Factor

Function	Edit frequency and level of Correction Factor.
Remote Command	CFEDIT[1~4] <freq>,<level>,<freq>,<level>, ... ,<freq>,<level> (1:Antenna, 2:Cable, 3:Other, 4:User)
Example	CFEDIT 30000000,2.5,240000000,3.2,1000000000,5.1;

COAD

[[:SENSe]:CORRection:CSET:ALL:DELeTe

	All Correction Clear
Function	Clears all correction data and turn off all states.
Remote Command	COAD [[:SENSe]:CORRection:CSET:ALL:DELeTe?
Example	COAD; CORR:CSET:ALL:DEL;

Display

DL

:DISPlay:WINDow:TRACe:Y:DLINe

	Display Line Amplitude
Function	Sets the amplitude of the Display Line.
Remote Command	DLΔf DL? :DISPlay:WINDow:TRACe:Y:DLINeΔf :DISPlay:WINDow:TRACe:Y:DLINe?
Response Message	Amplitude of Display Line
Value of f	Reference Level to (Reference Level-10*Scale/DIV) (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	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	
Function	Turns Display Line ON or OFF.	
Remote Command	DLSΔn DLSΔsw DLS? :DISPlay:WINDow:TRACe:Y:DLINe:STATeΔn :DISPlay:WINDow:TRACe:Y:DLINe:STATeΔsw :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
Function	Sets the threshold level and ignores data below this value.
Remote Command	THΔf TH? :DISPlay:WINDow:TRACe:Y:TLINeΔf :DISPlay:WINDow:TRACe:Y:TLINe?
Response Message	Threshold line amplitude
Value of f	Reference Level to Reference Level-10*Scale/DIV (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	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	
Function	Turns Threshold Line ON or OFF.	
Remote Command	THSΔn THSΔsw THS? :DISPlay:WINDow:TRACe:Y:TLINe:STATeΔn :DISPlay:WINDow:TRACe:Y:TLINe:STATeΔsw :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
Function	Places the character data on the title area of the display. Available characters are Alpha-numeric.
Remote Command	TITLE Δ text TITLE? :DISPlay:ANNotation:TITLe:DATA Δ text :DISPlay:ANNotation:TITLe:DATA?
Response Message	Title
Value of text	String
Initial setting	Noname
Example	TITLE SignalAnalyzer; TITLE?; DISP:ANN:TITL:DATA SignalAnalyzer; DISP:ANN:TITL:DATA?;

WH

:DISPlay:WINDow:WHITe

	White Mode	
Function	Turns the white mode ON or OFF.	
Remote Command	WH Δ n WH Δ sw WH? :DISPlay:WINDow:WHITe Δ n :DISPlay:WINDow:WHITe Δ 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?Δ'file_folder' :MMEMory:CATalog?Δ'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 which type was defined by the extension.
Remote Command	FSAVEΔ'file_name' :MMEMory:STOReΔ'file_name'
Value of file_name	File Path + File Name
Supported Extension	bmp : Bitmap jpg : jpeg png : png emc : EMC Config emt : EMC Limit
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	FLOADΔ'file_name' :MMEMory:LOADΔ'file_name'
Value of file_name	File Path + File Name
Supported Extension	emc : EMC Config emt : EMC Limit
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	FDELΔ'file_name' :MMEMory:DELeTeΔ'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	FCOPYΔ'src_file_name', 'dest_file_name' :MMEMory:COPYΔ'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	FRENAMEΔ'src_file_name','dest_file_name' :MMEMory:MOVEΔ'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 is 30 MByte.
Remote Command	FMOVEΔ'file_name',definite_length_block FMOVE?Δ'file_name' MMEMory:DATAΔ'file_name',definite_length_block MMEMory:DATA?Δ'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

FA

[[:SENSe]:FREQuency:STARt

	Start Frequency	
Function	Sets the start frequency for scan measurement.	
Remote Command	FAΔf	
	FA?	
	[:SENSe]:FREQuency:STARtΔf	
	[: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
Function	Sets the stop frequency for scan measurement.
Remote Command	FBAf FB? [:SENSe]:FREQuency:STOPΔf [: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?;

Limit Line

LLCS[1~3]

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

	Limit Line Check State	
Function	Turns the limit line checking on or off.	
Remote Command	LLCS[1~3] Δ n LLCS[1~3] Δ sw LLCS[1~3]? :CALCulate:LLINe[1~3]:CHECK:STATe Δ n :CALCulate:LLINe[1~3]:CHECK:STATe Δ 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
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
Function	Turns the alarm state on or off
Remote Command	ALARM Δ n ALARM Δ sw ALARM? :CALCulate:LLINe:ALARM Δ n :CALCulate:LLINe:ALARM Δ 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?

LLEDIT[1~3]

	Edit Limit Line
Function	Edit frequency and level of Limit Line.
Remote Command	LLEDIT[1~3] <freq>,<level>,<freq>,<level>, ... ,<freq>,<level> (1:TraceA, 2:TraceB, 3:TraceC)
Example	LLEDIT1 30000000,30,24000000,30,24000000,38,100000000,38;

LLAO

:CALCulate:LLINe:AOff

	Clear Limit Line
Function	Clear Limit Line.
Remote Command	LLAO :CALCulate:LLINe:AOff?
Example	LLAO; CALC:LLIN:AOff?;

Marker

MS[1~9]

:CALCulate:MARKer[1~9]:STATe

	Marker State	
Function	Sets the selected marker state.	
Remote Command	MS[1~9]Δn MS[1~9]Δsw MS[1~9]? :CALCulate:MARKer[1~9]:STATeΔn :CALCulate:MARKer[1~9]:STATeΔsw :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
Function	Sets the selected marker to Normal, Delta Mode.
Remote Command	MM[1~9]Δsw MM[1~9]? :CALCulate:MARKer[1~9]:MODEΔsw :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
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] Δ f MF[1~9]? :CALCulate:MARKer[1~9]:X Δ 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
Function	Returns on the 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	
Function	Selects the marker trace.	
Remote Command	MT[1~9] Δ n MT[1~9]? :CALCulate:MARKer[1~9]:MKT Δ 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	
Function	Sets the marker table state.	
Remote Command	MTB Δ n MTB Δ sw MTB? :CALCulate:MARKer:TABLE:STATe Δ n :CALCulate:MARKer:TABLE:STATe Δ 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
Function	Turns off all of the markers.
Remote Command	MAO :CALCulate:MARKer:AOff
Example	MAO; CALC:MARK:AOff;

Measurement

SCAN

:MEASure:SCAN

	Scan	
Function	Starts or stops Scan Measurement.	
Remote Command	SCAN Δ sw :MEASure:SCAN Δ sw	
Value of sw	RUN	: Start Scan
	HOLD	: Hold Scan
	STOP	: Stop Scan
Example	SCAN START; MEAS:SCAN START;	

RTYPE

	Repetition	
Function	Sets Run Type to Single or Continuous.	
Remote Command	RTYPE Δ sw RTYPE?	
Response Message	SING	: Single Mode
	CONT	: Continuous Mode
Value of sw	SINGle	: Single Mode
	CONT	: Continuous Mode
Example	RTYPE SING; RTYPE?;	

SMODE

	Screen Mode	
Function	Sets Screen Mode to "Scan+CISPR" or "Scan Only".	
Remote Command	SMODEΔsw SMODE?	
Response Message	BOTH	: Scan + CISPR
	SCAN	: Scan Only
Value of sw	BOTH	: Scan + CISPR
	SCAN	: Scan Only
Example	SMODE BOTH; SMODE?;	

TTYPE

	TraceA Type	
Function	Sets TraceA Type to "Clr&Wrt" or "MaxHold".	
Remote Command	TTYPEΔsw	
	TTYPE?	
Response Message	WRIT	: Clear & Write
	MAXH	: Max Hold
Value of sw	WRITe	: Clear & Write
	MAXHold	: Max Hold
Example	TTYPE WRIT;	
	TTYPE?;	

Meas. Control

CF

[[:SENSe]:FREQuency:CENTer

	Center Frequency
Function	Sets the CISPR measurement frequency.
Remote Command	CFΔf CF? [:SENSe]:FREQuency:CENTerΔf [: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?;

ST

[[:SENSE]:SWEep:TIME

	Sweep Time	
Function	Sets the sweep time or measurement time.	
Remote Command	STΔf	
	ST?	
	[:SENSE]:SWEep:TIMEΔf	
	[:SENSE]:SWEep:TIME?	
Response Message	Sweep Time (s)	
Value of f	5 ms to 2000 s	: Sweep mode
	1 μ 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?;	

RB

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

	Resolution Bandwidth
Function	Sets the RBW value.
Remote Command	RBAf RB? [:SENSe]:BANDwidth BWIDth[:RESolution]Δf [: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?;

RBA

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

	Resolution Bandwidth Auto	
Function	Sets the RBW mode to auto mode or manual mode.	
Remote Command	RBA Δ n RBA Δ sw RBA?	
	[:SENSe]:BANDwidth BWIDth[:RESolution]:AUTO Δ n [:SENSe]:BANDwidth BWIDth[:RESolution]:AUTO Δ sw [:SENSe]:BANDwidth BWIDth[:RESolution]: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	RBA 1; RBA ON; RBA? BAND:AUTO 1; BAND:AUTO ON; BAND:AUTO?;	

AT

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

	Attenuation
Function	Sets the amount of attenuation for the input attenuator.
Remote Command	ATΔf AT? [:SENSe]:POWer[:RF]:ATTenuationΔf [:SENSe]:POWer[:RF]:ATTenuation?
Response Message	the amount of attenuation (dB)
Value of f	0 dB to 55 dB (step: 5 dB)
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	
Function	Sets input attenuation mode to auto mode or manual mode. If auto mode is selected, the amount of attenuation is adjusted automatically.	
Remote Command	ATAΔn ATAΔsw ATA? [:SENSe]:POWer[:RF]:ATTenuation:AUTOΔn [:SENSe]:POWer[:RF]:ATTenuation:AUTOΔsw [: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?;	

DETPK

	Peak Detector	
Function	Sets Peak Detector ON or OFF for CISPR measurement.	
Remote Command	DETPK Δ n DETPK Δ 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	
Function	Sets Average Detector ON or OFF for CISPR measurement.	
Remote Command	DETAV Δ n DETAV Δ 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	
Function	Sets Log-Average Detector ON or OFF for CISPR measurement.	
Remote Command	DETLOGΔn DETLOGΔsw 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	
Function	Sets RMS-Average Detector ON or OFF for CISPR measurement.	
Remote Command	DETRMSΔn DETRMSΔsw 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	
Function	Sets CISPR-Average Detector ON or OFF for CISPR measurement.	
Remote Command	DETCISPR Δ n DETCISPR Δ 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	
Function	Sets Quasi-Peak Detector ON or OFF for CISPR measurement.	
Remote Command	DETQPΔn DETQPΔsw 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?;	

IA

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

	Internal Amplifier
Function	Activates the internal amplifier.
Remote Command	IAΔn IAΔsw IA? [:SENSe]:POWer[:RF]:GAIN[:STATe]Δn [:SENSe]:POWer[:RF]:GAIN[:STATe]Δsw [: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?;

RESETCISPR

	Reset Max/Min Hold
Function	Resets the level of Max/Min Hold.
Remote Command	RESETCISPR
Example	RESETCISPR;

RESETCISPR

	Attenuator Adjust
Function	Resets the level of Attenuator.
Remote Command	ATTAD
Example	ATTAD;

Mode

MODE

:INSTrument[:SElect]

	Mode	
Function	Sets current Mode.	
Remote Command	MODE Δ sw	
	MODE?	
	:INSTrument[:SElect] Δ sw	
	:INSTrument[:SElect]?	
Response Message	SA	: Spectrum Mode
	EMC	: EMI Receiver Mode
Value of sw	SA	: Spectrum Mode
	EMC	: EMI Receiver Mode
Initial setting	SA	
Example	MODE SA;	
	MODE?;	
	INST SA;	
	INST?;	

Mode setup

TRANGE

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

STYPE

	Config Type	
Function	Sets Scan Type of Scan Mode.	
Remote Command	STYPEΔsw 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	
Function	Sets Freq Step of Scan Mode.	
Remote Command	FSTEP Δ 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?;	

RDETPK

	Peak Detector	
Function	Sets Peak Detector ON or OFF for Scan Measurement.	
Remote Command	RDETPK Δ n RDETPK Δ sw RDETPK?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	1	
Example	RDETPK 1; RDETPK ON; RDETPK?;	

RDETAV

	Average Detector	
Function	Sets Average Detector ON or OFF for Scan Measurement.	
Remote Command	RDETAVΔn RDETAVΔsw RDETAV?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	RDETAV 1; RDETAV ON; RDETAV?;	

RDETLOG

	Log-Average Detector	
Function	Sets Log-Average Detector ON or OFF for Scan Measurement.	
Remote Command	RDETLOGΔn RDETLOGΔsw RDETLOG?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	RDETLOG 1; RDETLOG ON; RDETLOG?;	

RDETRMS

	RMS-Average Detector	
Function	Sets RMS-Average Detector ON or OFF for Scan Measurement.	
Remote Command	RDETRMSΔn RDETRMSΔsw RDETRMS?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	RDETRMS 1; RDETRMS ON; RDETRMS?;	

RDETCISPR

	CISPR-Average Detector	
Function	Sets CISPR-Average Detector ON or OFF for Scan Measurement.	
Remote Command	RDETCISPR Δ n RDETCISPR Δ sw RDETCISRP?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	RDETCISPR 1; RDETCISPR ON; RDETCISPR?;	

RDETQP

	Quasi-Peak Detector	
Function	Sets Quasi-Peak Detector ON or OFF for Scan Measurement.	
Remote Command	RDETQP Δ n RDETQP Δ sw RDETQP?	
Response Message	1	: ON
	0	: OFF
Value of n	1	: ON
	0	: OFF
Value of sw	ON	: ON
	OFF	: OFF
Initial setting	0	
Example	RDETQP 1; RDETQP ON; RDETQP?;	

Peak Search

MPK[1~9]

:CALCulate:MARKer[1~9]:MAXimum

	Peak Search
Function	Places the selected marker on the highest point of the marker trace.
Remote Command	MPK[1~9] :CALCulate:MARKer[1~9]:MAXimum
Example	MPK; MPK5; CALC:MARK:MAX; CALC:MARK5:MAX;

MPKN[1~9]

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

	Next Peak Search
Function	Places the selected marker on the next highest point of the marker trace.
Remote Command	MPKN[1~9] :CALCulate:MARKer[1~9]:MAXimum:NEXT
Example	MPKN; MPKN5; CALC:MARK:MAX:NEXT; CALC:MARK5:MAX:NEXT;

MPKL[1~9]

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

	Next Left Peak Search
Function	Places the selected marker on the next-left peak point of the marker trace.
Remote Command	MPKL[1~9] :CALCulate:MARKer[1~9]:MAXimum: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
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
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
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
Function	Sets the multi peak number.
Remote Command	MKPKN Δ n MKPKN? :CALCulate:MARKer:PEAK:MULTi:NUMber Δ 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
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
Function	Sets the multi peak trace.
Remote Command	MKPKTΔn MKPKT? :CALCulate:MARKer:PEAK:MULTi:TRACeΔn :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
Function	Sets the peak least amplitude for peak search. It is valid when MPKPA is set to PAR.
Remote Command	MPKEΔf MPKE? :CALCulate:MARKer:PEAK:EXCursionΔf :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
Function	Sets the low limit line for peak search. It is valid when MPKPA is set to PAR.
Remote Command	MPKTHΔf MPKTH? :CALCulate:MARKer:PEAK:THResholdΔf :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 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	-100 dBm
Example	MPKTH -80; MPKTH -100DBM?; MPKTH?; CALC:MARK:PEAK:THR -80; CALC:MARK:PEAK:THR -100DBM; CALC:MARK:PEAK:THR?;

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;

System

BEEP

	Beep	
Function	Turns Beep ON or OFF when pressing key pad.	
Remote Command	BEEPΔn BEEPΔsw 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 terminal.	
Remote Command	ECHOΔn ECHOΔsw 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

TRD

:TRACe[:DATA]

	Query Trace Data
Function	Queries the scan level data
Remote Command	TRD?Δsw :TRACe[:DATA]?Δsw
Response Message	Data[0],Data[1],Data[2],.....
Value of sw	TRACE1 : Trace A TRACE2 : Trace B TRACE3 : Trace C CISPR : Active CISPR Detector MAXCISPR : Max CISPR Detector MINCISPR : Min CISPR Detector
Example	TRD? TRACE1; TRD? CISPR; TRAC? TRACE1; TRAC? CISPR;

TRDF

:TRACe[:DATA]:FREQuency

	Query Trace Data
Function	Queries the scan frequency data.
Remote Command	TRD? Δ sw :TRACe[:DATA]? Δ 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;

TDF

:TRACe:FORMat

	Trace Format	
Function	Sets the trace format.	
Remote Command	TDF Δ sw	
	TDF?	
	:TRACe:FORMat Δ 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 Δ sw TSO? :TRIGger[:SEQuence]:SOURce Δ 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 Δ sw TSL? :TRIGger[:SEQuence]:SLOPe Δ 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

Ordered by function

Index	Description	SA Command	SCPI Command	Suffix
Amplitude	Reference Level	RL	:DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel	<amplitude> ?
Amplitude	Scale/Divide	SD	:DISPlay:WINDow:TRACe:Y[:SCALe]:PDIVision	<amplitude> ?
Amplitude	Amplitude Units	AU	:UNIT:POWer	DBM DBU DBUA DBUVM DBUAM DBMV DBMA DBPT DBPW V W A ?
Amplitude	Edit Correction Factor	CFEDIT		<freq>,<level>,<freq>, <level>, ... , <freq>, <level>
Amplitude	All Correction Clear	COAD	[:SENSe]:CORRection:CSET:ALL:DELeTe	none
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	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_nam e2'>
File	Rename	FRENAME	:MMEMory:MOVE	< file_name1'>, < file_name2'>
File	Move	FMOVE	:MMEMory:DATA	< file_name'>, definite_length ? <file_name>
Frequency	Start Frequency	FA	[:SENSe]:FREQuency:STARt	<frequency> ?
Frequency	Stop Frequency	FB	[:SENSe]:FREQuency:STOP	<frequency> ?
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	Edit Limit Line	LLEDIT		<freq>,<level>,<freq>, <level>, ... , <freq>, <level>
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 ?
Marker	Marker All Off	MAO	:CALCulate:MARKer:AOFF	none
Measurement	Scan	SCAN	:MEASure:SCAN	RUN HOLD STOP ?
Measurement	Repetition	RTYPE		SINGLE CONTInuous ?
Measurement	Screen Mode	SMODE		BOTH SCAN ?
Measurement	TraceA Type	TTYPE		WRITE MAXHold ?
Meas - Control	Meas. Frequency	CF	[:SENSe]:FREQuency:CENTer	<frequency> ?
Meas - Control	Sweep Time	ST	[:SENSe]:SWEep:TIME	<time> ?

REMOTE COMMANDS

Index	Description	SA Command	SCPI Command	Suffix
Meas - Control	RBW	RB	[[:SENSe]:BANDwidth BWIDth[:RESolution]	<frequency> ?
Meas - Control	RBW Auto	RBA	[[:SENSe]:BANDwidth BWIDth[:RESolution]:AUTO	OFF ON 0 1 ?
Meas - Control	Attenuation	AT	[[:SENSe]:POWER[:RF]:ATTenuation	<amplitude> ?
Meas - Control	Attenuation Auto	ATA	[[:SENSe]:POWER[:RF]:ATTenuation:AUTO	OFF ON 0 1 ?
Meas - Control	Detector - Peak	DETPK		OFF ON 0 1 ?
Meas - Control	Detector - Average	DETAV		OFF ON 0 1 ?
Meas - Control	Detector - Log-Avg	DETLG		OFF ON 0 1 ?
Meas - Control	Detector - RMS-Avg	DETRMS		OFF ON 0 1 ?
Meas - Control	Detector - CISPR-Avg	DETCISPR		OFF ON 0 1 ?
Meas - Control	Detector - QuasiPeak	DETQP		OFF ON 0 1 ?
Meas - Control	Internal Amplifier	IA	[[:SENSe]:POWER[:RF]:GAIN[:STATE]	OFF ON 0 1 ?
Meas - Control	Reset Max/Min Hold	RESETCISPR		none
Meas - Control	Attenuator Adjust	ATTAD		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	RDETPK		OFF ON 0 1 ?
Mode - Setup	Detector - Average	RDETAV		OFF ON 0 1 ?
Mode - Setup	Detector - Log-Avg	RDETLG		OFF ON 0 1 ?
Mode - Setup	Detector - RMS-Avg	RDETRMS		OFF ON 0 1 ?
Mode - Setup	Detector - CISPR-Avg	RDETCISPR		OFF ON 0 1 ?
Mode - Setup	Detector - QuasiPeak	RDETQP		OFF ON 0 1 ?
Peak Search	Peak Search	MPK[1~9]	:CALCulate:MARKer[1~9]:MAXimum	none
Peak Search	Next Peak Search	MPKN[1~9]	:CALCulate:MARKer[1~9]:MAXimum:NEXT	none
Peak Search	Next Left Peak Search	MPKL[1~9]	:CALCulate:MARKer[1~9]:MAXimum:LEFT	none
Peak Search	Next Right Peak Search	MPKR[1~9]	:CALCulate:MARKer[1~9]:MAXimum:RIGHT	none
Peak Search	Minimum Search	MPKM[1~9]	:CALCulate:MARKer[1~9]:MINimum	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> ?
Preset	Preset	PRST	:SYSTem:PRESet	none
Printer	Hard Copy	HCOPY	:HCOPY[:IMMediate]	none
System	Beep	BEEP		OFF ON 0 1 ?
System	Echo	ECHO		OFF ON 0 1 ?
Trace	Query Trace Data	TRD	:TRACe[:DATA]	? TRACE1 TRACE2 TRACE3
Trace	Query Trace Data	TRDF	:TRACe[:DATA]:FREQuency	? TRACE1 TRACE2 TRACE3
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

REMOTE COMMANDS

Index	Description	SA Command	SCPI Command	Suffix
Common	*SRE	*SRE	*SRE	<integer> ?
Common	*STB	*STB	*STB	?
Others	ESE2	ESE2		<integer> ?
Others	ESR2	ESR2		?
Others	Error Code	ERR	:SYSTem:ERRor[:NEXT]	?

REMOTE COMMANDS

Ordered by SA 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 ?
Meas - Control	Attenuation	AT	[:SENSe]:POWer[:RF]:ATTenuation	<amplitude> ?
Meas - Control	Attenuation Auto	ATA	[:SENSe]:POWer[:RF]:ATTenuation:AUTO	OFF ON 0 1 ?
Meas - Control	Attenuator Adjust	ATTAD		none
Amplitude	Amplitude Units	AU	:UNIT:POWer	DBM DBUV DBUA DBUVM DBUAM DBMV DBMA DBPT DBPW V W A ?
System	Beep	BEEP		OFF ON 0 1 ?
Meas - Control	Meas. Frequency	CF	[:SENSe]:FREQuency:CENTer	<frequency> ?
Amplitude	Edit Correction Factor	CFEDIT		<freq>,<level>,<freq>,<level>,...,<freq>,<level>
Amplitude	All Correction Clear	COAD	[:SENSe]:CORRection:CSET:ALL:DELeTe	none
Meas - Control	Detector - Average	DETA		OFF ON 0 1 ?
Meas - Control	Detector - CISPR-Avg	DETCISPR		OFF ON 0 1 ?
Meas - Control	Detector - Log-Avg	DETLOG		OFF ON 0 1 ?
Meas - Control	Detector - Peak	DETPK		OFF ON 0 1 ?
Meas - Control	Detector - QuasiPeak	DETQP		OFF ON 0 1 ?
Meas - Control	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:COPIY	<'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'>
File	Save	FSAVE	:MMEMory:STORe	<'file_name'>
Mode - Setup	Scan Mode	FSTEP		LINear LOGarithmic ?

REMOTE COMMANDS

Index	Description	SA Command	SCPI Command	Suffix
Printer	Hard Copy	HCOPY	:HCOPY[:IMMediate]	none
Meas - Control	Internal Amplifier	IA	[:SENSe]:POWer[:RF]:GAIN[:STATe]	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	Edit Limit Line	LLEDIT		<freq>,<level>,<freq>,<level>, ...,<freq>,<level>
Limit Line	Limit Line Fail Count	LLFC[1~3]	:CALCulate:LLINE[1~3]:FAIL:COUNT	?
Marker	Marker Amplitude	MA[1~9]	:CALCulate:MARKer[1~9]:Y	?
Marker	Marker All Off	MAO	:CALCulate:MARKer:AOFF	none
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]:MAXimum	none
Peak Search	Peak Excursion	MPKE	:CALCulate:MARKer:PEAK:EXCursion	<amplitude> ?
Peak Search	Next Left Peak Search	MPKL[1~9]	:CALCulate:MARKer[1~9]:MAXimum:LEFT	none
Peak Search	Minimum Search	MPKM[1~9]	:CALCulate:MARKer[1~9]:MINimum	none
Peak Search	Next Peak Search	MPKN[1~9]	:CALCulate:MARKer[1~9]:MAXimum:NEXT	none
Peak Search	Peak to Peak Search	MPKP[1~9]	:CALCulate:MARKer[1~9]:PTPeak	none
Peak Search	Next Right Peak Search	MPKR[1~9]	:CALCulate:MARKer[1~9]:MAXimum: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
Meas - Control	RBW	RB	[:SENSe]:BANDwidth BWIDth[:RESolution]	<frequency> ?
Meas - Control	RBW Auto	RBA	[:SENSe]:BANDwidth BWIDth[:RESolution]:AUTO	OFF ON 0 1 ?
Mode - Setup	Detector - Average	RDETAV		OFF ON 0 1 ?
Mode - Setup	Detector - CISPR-Avg	RDETCISPR		OFF ON 0 1 ?
Mode - Setup	Detector - Log-Avg	RDETLOG		OFF ON 0 1 ?
Mode - Setup	Detector - Peak	RDETPK		OFF ON 0 1 ?
Mode - Setup	Detector - QuasiPeak	RDETQP		OFF ON 0 1 ?
Mode - Setup	Detector - RMS-Avg	RDETRMS		OFF ON 0 1 ?
Meas - Control	Reset Max/Min Hold	RESETCISPR		none
Amplitude	Reference Level	RL	:DISPlay:WINDow:TRACE:Y[:SCALE]:RLEVEL	<amplitude> ?
Measurement	Repetition	RTYPE		SINGLE CONTinuous ?
Measurement	Scan	SCAN	:MEASure:SCAN	RUN HOLD STOP ?
Amplitude	Scale/Divide	SD	:DISPlay:WINDow:TRACE:Y[:SCALE]:PDIVision	<amplitude> ?
Measurement	Screen Mode	SMODE		BOTH SCAN ?

REMOTE COMMANDS

Index	Description	SA Command	SCPI Command	Suffix
Meas - Control	Sweep Time	ST	[[:SENSe]:SWEep:TIME	<time> ?
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	Query Trace Data	TRDF	:TRACe[:DATA]:FREQuency	? TRACE1 TRACE2 TRACE3
Trigger	Trigger Slope	TSL	:TRIGGer[:SEQuence]:SLOPe	POSitive NEGative ?
Trigger	Trigger Source	TSO	:TRIGGer[:SEQuence]:SOURce	IMMEDIATE EXTernal ?
Measurement	TraceA Type	TTYPE		WRITe MAXHold ?
Display	White Mode	WH	:DISPlay:WINDow:WHITe	OFF ON 0 1 ?

REMOTE COMMANDS

Ordered by 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 Excursion	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 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]:MAXimum	none
Peak Search	Next Left Peak Search	MPKL[1~9]	:CALCulate:MARKer[1~9]:MAXimum:LEFT	none
Peak Search	Next Peak Search	MPKN[1~9]	:CALCulate:MARKer[1~9]:MAXimum:NEXT	none
Peak Search	Next Right Peak Search	MPKR[1~9]	:CALCulate:MARKer[1~9]:MAXimum:RIGHT	none
Peak Search	Minimum Search	MPKM[1~9]	:CALCulate:MARKer[1~9]:MINimum	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	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 ?
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
Mode	Mode	MODE	:INSTrument[:SElect]	SA EMC ?

REMOTE COMMANDS

Index	Description	SA Command	SCPI Command	Suffix
Measurement	Scan	SCAN	:MEASure:SCAN	RUN HOLD STOP ?
File	Read	FREAD	:MMEMory:CATalog	? <'directory_name'>
File	Copy	FCOPY	:MMEMory:COPIY	<'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	Query Trace Data	TRDF	:TRACe[:DATA]:FREQuency	? TRACE1 TRACE2 TRACE3
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 DBUV DBUA DBUVM DBUAM DBMV DBMA DBPT DBPW V W A ?
Meas - Control	RBW	RB	[:SENSe]:BANDwidth BWiDth[:RESolution]	<frequency> ?
Meas - Control	RBW Auto	RBA	[:SENSe]:BANDwidth BWiDth[:RESolution]:AUTO	OFF ON 0 1 ?
Amplitude	All Correction Clear	COAD	[:SENSe]:CORRection:CSET:ALL:DELeTe	none
Meas - Control	Meas. Frequency	CF	[:SENSe]:FREQuency:CENTer	<frequency> ?
Frequency	Start Frequency	FA	[:SENSe]:FREQuency:STARt	<frequency> ?
Frequency	Stop Frequency	FB	[:SENSe]:FREQuency:STOP	<frequency> ?
Meas - Control	Attenuation	AT	[:SENSe]:POWer[:RF]:ATTenuation	<amplitude> ?
Meas - Control	Attenuation Auto	ATA	[:SENSe]:POWer[:RF]:ATTenuation:AUTO	OFF ON 0 1 ?
Meas - Control	Internal Amplifier	IA	[:SENSe]:POWer[:RF]:GAIN[:STATe]	OFF ON 0 1 ?
Meas - Control	Sweep Time	ST	[:SENSe]:SWEep:TIME	<time> ?

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

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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6.5 The above Warranty does not apply to:

6.5.1 Defects resulting from software not supplied by Aeroflex, from unauthorized modification or misuse or from operation outside of the specification.

6.5.2 Third party produced proprietary software which Aeroflex may deliver with its products, in such case the third party software license agreement including its warranty terms shall apply.

6.6 The remedies offered above are sole and exclusive remedies and to the extent permitted by applicable law are in lieu of any implied conditions, guarantees or warranties whatsoever and whether statutory or otherwise as to the Licensed Software all of which are hereby expressly excluded.

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7.2 Aeroflex shall not be liable if the alleged infringement:

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- 7.2.2 is based upon the use of the Licensed Software alone or in combination with other software in equipment not functionally identical to the Designated Equipment, or
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8. TERMINATION

8.1 Notwithstanding anything herein to the contrary, this License shall forthwith determine if the Licensee:

- 8.1.1 As an individual has a Receiving Order made against him or is adjudicated bankrupt or compounds with creditors or as a corporate body, compounds with creditors or has a winding-up order made against it or
- 8.1.2 Parts with possession of the Designated Equipment.

8.2 This License may be terminated by notice in writing to the Licensee if the Licensee shall be in breach of any of its obligations hereunder and continue in such breach for a period of 21 days after notice thereof has been served on the Licensee.

8.3 On termination of this Agreement for any reason, Aeroflex may require the Licensee to return to Aeroflex all copies of the Licensed Software in the custody of the Licensee and the Licensee shall, at its own cost and expense, comply with such requirement within 14 days and shall, at the same time, certify to Aeroflex in writing that all copies of the Licensed Software in whatever form have been obliterated from the Designated Equipment.

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- 9.2 If any third party software supplied with the Licensed Software is supplied with, or contains or displays the third party's own license terms then the Licensee shall abide by such third party license terms (for the purpose of this Article the term "third party" shall include other companies within the Aeroflex group of companies).

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The Licensee undertakes that where necessary the Licensee will conform with all relevant export regulations imposed by the Governments of the United Kingdom and/or the United State of America.

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12. NOTICES

Any notice to be given by the Licensee to Aeroflex shall be addressed to:

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

13. LAW AND JURISDICTION

This Agreement shall be governed by the laws of England and shall be subject to the exclusive jurisdiction of the English courts. This agreement constitutes the whole agreement between the parties and may be changed only by a written agreement signed by both parties.

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April 2006