

**LSA-30/132/265**  
**Signal Analyzer**  
**EMI Receiver Manual**  
**Ver 1.3**

Read this manual before using the equipment.  
Keep this manual with the equipment



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## SECTION 1 GENERAL

### Introduction

This option is provided for conducted emission measurement of commercial electrical /electronic products, this operating manual will describe system setup method for EMC measurement and operation of each menu. (Notice: The EMC software must be installed to system for using EMC measurement options.)

The EMC measurement options are used purposes for emission about EMI Receiver functions. You can get information with this device itself not to use exterior PC but to have options are supplied by EMC Option Software.

※ EMC : Electro-Magnetic Compatibility

### Licensing the EMC Measurement

EMC measurement of the two following options can be a way for the certification.

**※ NOTE**

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 EMC measurement licensed, you can skip the licensing. You must 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.

---

<Activation Key Authentication Code with the way>

1. Connect keyboard and mouse to the PS2 ports or the USB ports.
2. Turn on the signal analyzer. And wait until the analyzer complete the power up sequence.
3. Press **System**, *Option Info.*, *Option Activate.*
4. Select “EMC” field in the license active dialog window.

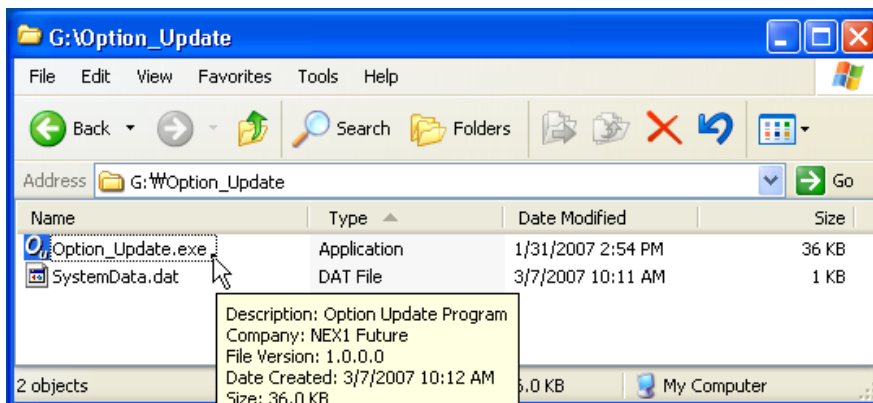
※ NOTE

All purchased options must be selected.

5. Enter the letters/digits of your 32 characters license code using the mouse or the keyboard. The license key number is a hexadecimal number.
6. Press *Activate.*
7. Licensing completed successfully then “Activation Success” dialog window was displayed. If “Invalid License!” was displayed, you enter the correct license code again.
8. Press *OK* or press any keypad, then you exit from the license menu.

<The external program using an authentication method >

1. You should contact the service center or selling agencies to receiver updating program and Key Code.

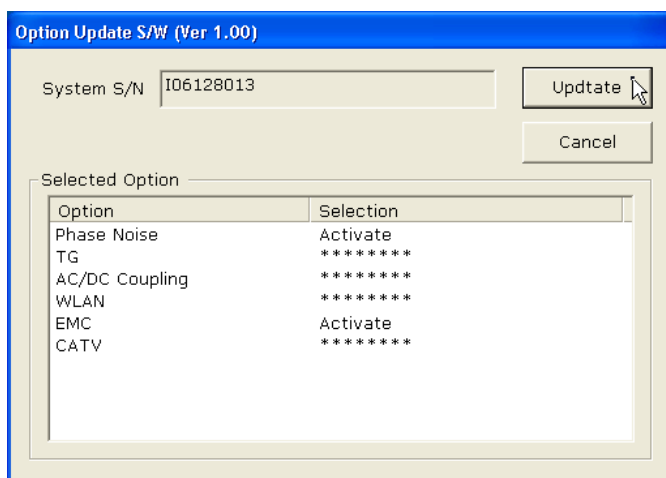


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2. Insert the option updating program and Key Code to USB Memory Stick or other storage devices, connect to the Signal Analyzer.

3. If Signal Analyzer program is the main driving, you are pressing the “Close” button to close the main program.

4. Execute Option\_Update.com



5. After you check the equipment serial number and authentication options, then click Update.

6. If normally renewed replaced with a Cancel button is Done.

7. Press Done button.

8. Signal Analyzer desktop shortcut icon for the program, double click the main driving.

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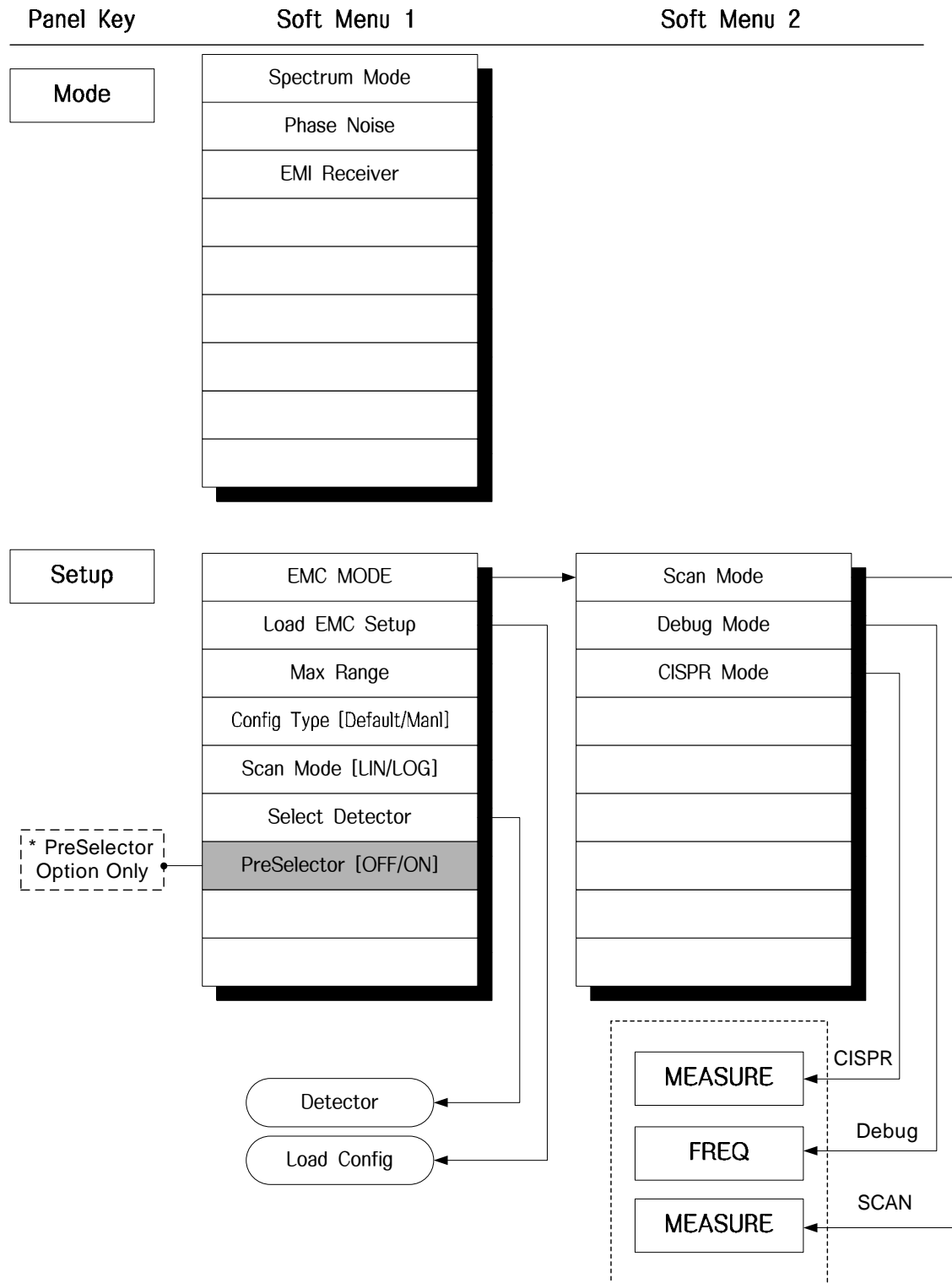
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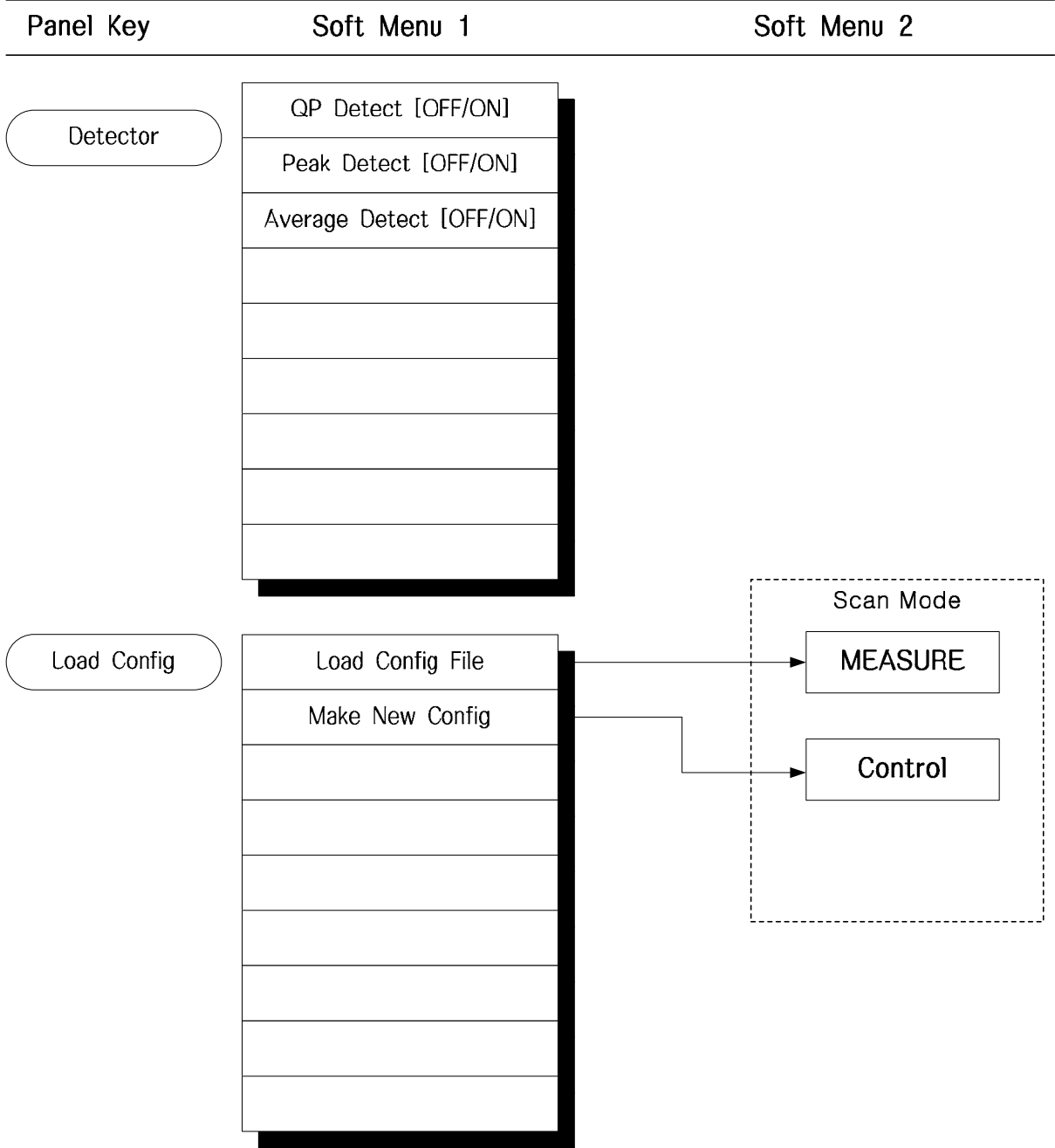
## SECTION 2 MENU TREE

This section describes the structure of the soft menus used by the EMC option. It should be noted that the structure regarding follows.

- (1) Panel key point to the hard keys on the front panel .
- (2) Soft Menu 1 indicates soft-key menu to the screen when presses hard-key.  
Soft Menu 2 indicates one of the sub menus of the Soft menu 1.
- (3) If you press Previous. Soft-key at Soft Menu2, return the soft Menu 1.
- (4) Option and unusable menu is represented to a gray background, and do not work.

# MENU TREE







Panel Key	Soft Menu 1	Soft Menu 2
-----------	-------------	-------------

*Scan Mode*

MEASURE

RUN
Hold
Stop
Repetition [Single/Cont]
Scan Info [OFF/ON]
Error Info..
Start Freq
Stop Freq

Error Info [OFF/ON]
Error No
Error Trace [PK/Avg/QP]
Limit Offset

Control

\* Config Table Appear

Select Range
Range Start
Range Stop
Range Step Size
Range RBW
Range Meas. Time
Range PreAmp [OFF/ON]
Range Attenuator
More 1 of 2

Use Stop Message [OFF/ON]
Select emt file
Display Limit
Select Antenna
Select Cable
Select Other
Select User



---

Panel Key

Soft Menu 1

Soft Menu 2

---

*Scan Mode*

FREQ

Start Freq

Stop Freq

*Scan/CISPR Mode*

AMPL

Ref. Level

Scale/Div

Units..

Corrections..

Input Z [50 ohm/75 ohm]

---

Panel Key

Soft Menu 1

Soft Menu 2

---

**Scan Mode**

Limit

Check Peak Limit [OFF/ON]

Check Avg. Limit [OFF/ON]

Check QP Limit [OFF/ON]

Make Peak Line..

Make Avg. Line..

Make QP Line..

All Clear

Alarm [OFF/ON]

Limit  
Table  
appear

Select [Freq/Ampl]

Insert Line

Delete Line

Clear

**Scan/Debug Mode**

Trigger

Free Run

External

Trig Slop [Pos/Neg]

---

Panel Key

Soft Menu 1

Soft Menu 2

---

*CISPR Mode*

MEASURE

Meas. Freq

Meas. Time

Meas. BW [Auto/Man]

Meas. Att [Auto/Man]

Meas. Detector

Set PreAmp [OFF/ON

Go To Scan Mode

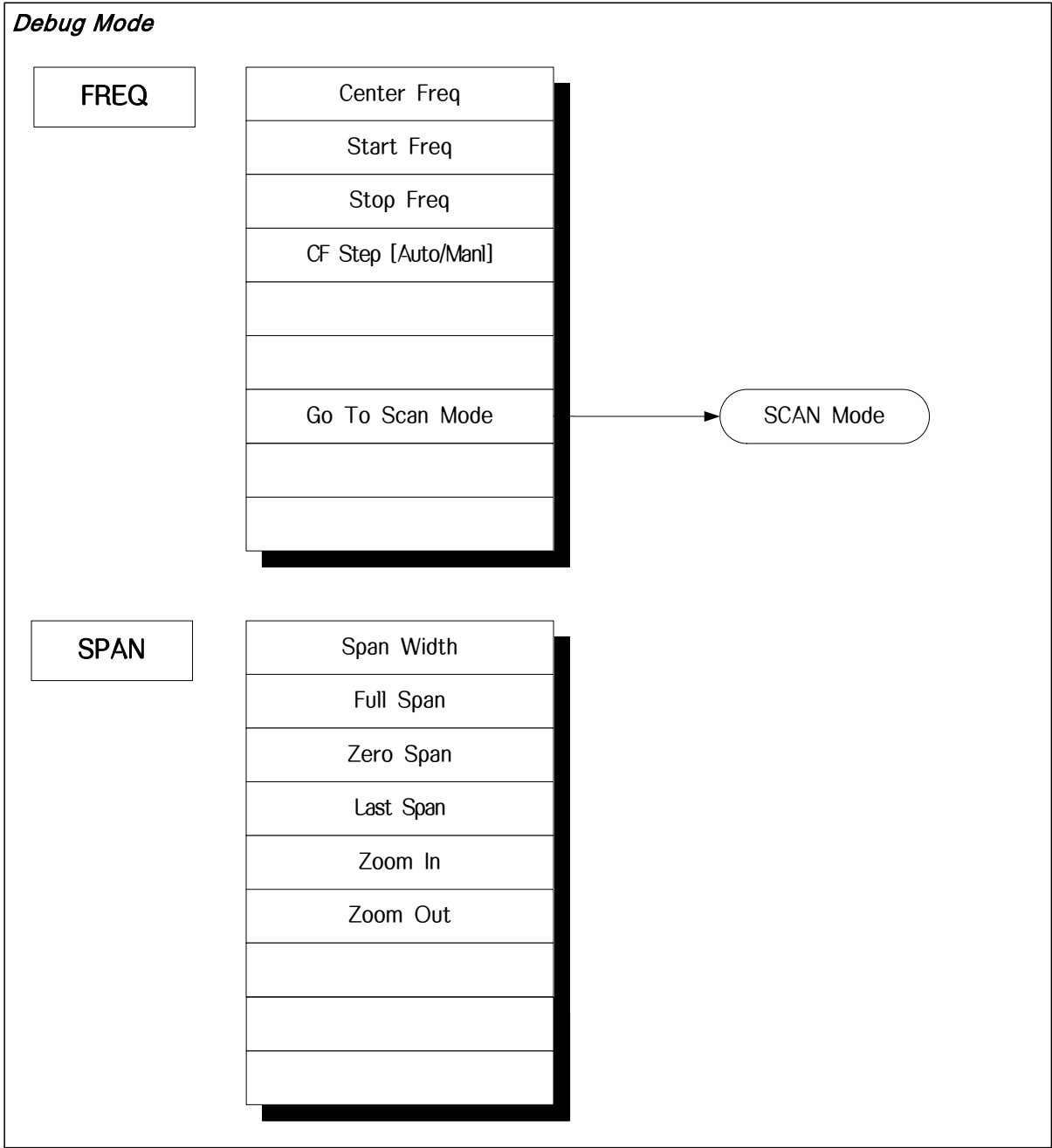
Att. Adjust

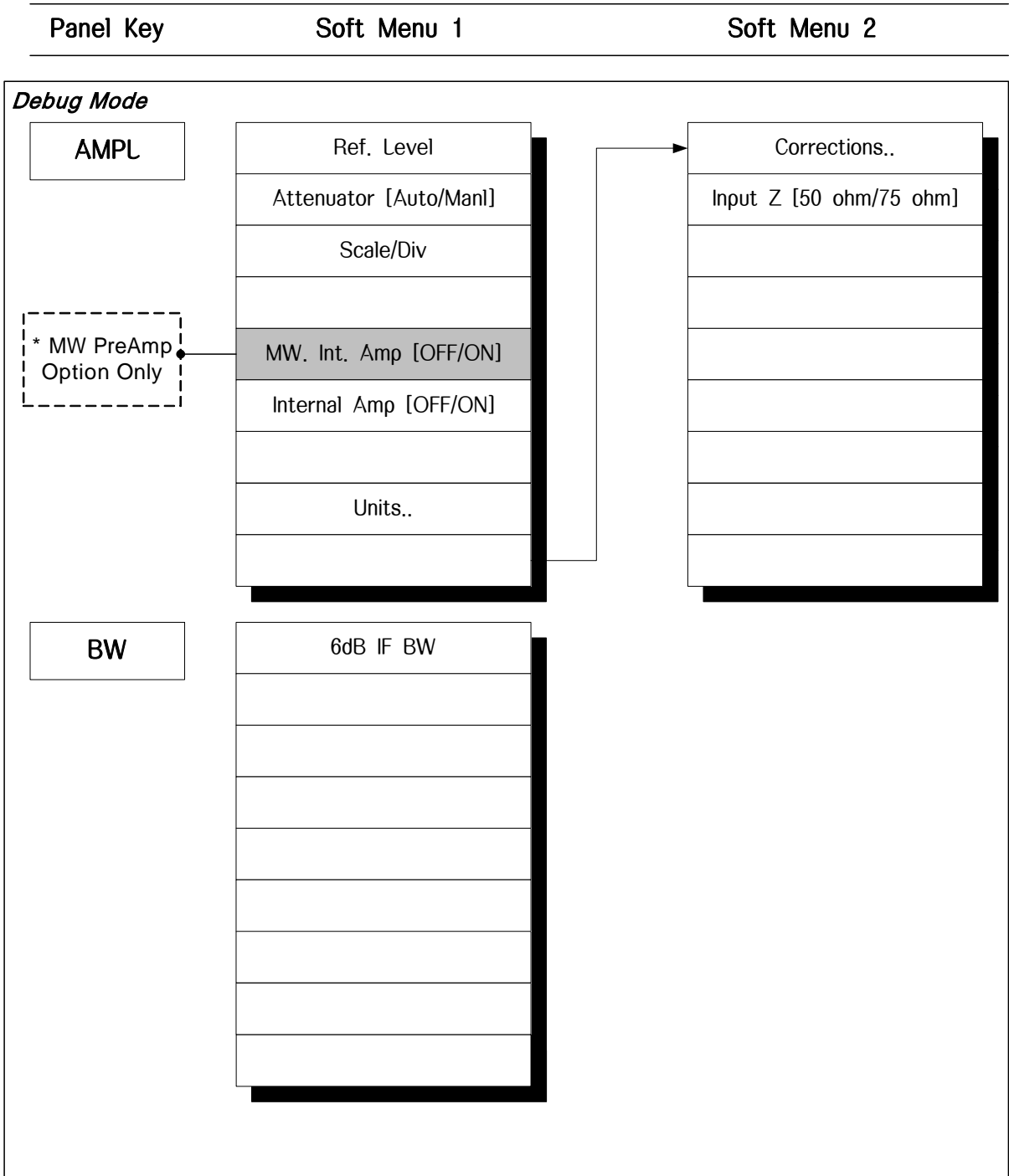
Detector

SCAN Mode



Panel Key	Soft Menu 1	Soft Menu 2
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Comment : Other keys are the same key at Spectrum mode. Here unmentioned on key details, please refer to the Operation Manual.

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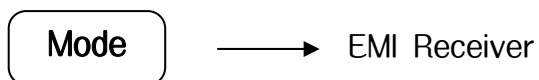
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## SECTION 3 MENU DESCRIPTION

If you want to use the EMC measurement capabilities, read the content of the following precautions must be used after.

### Entry EMC Mode

EMC measurement capability in the use of this equipment requires that a system must switch EMC Mode.

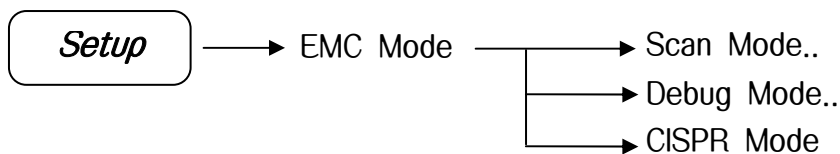


Signal Analyzer on the front panel, select the **Mode** key and on the right of the Soft function key to select the *EMI Receiver*. If *EMI Receiver* key is not activate, the current system is not installed EMC Option. (EMC added to the Option is available on request, please specify service providers.)

---

## Selection EMC Measurement Mode

EMC measurement mode, depending on how to measurement, can be divided into Scan Mode, CISPR Mode and Debug Mode. If you entered EMC Mode, the early state is Scan Mode. In order to change the measurement mode, following the next set.

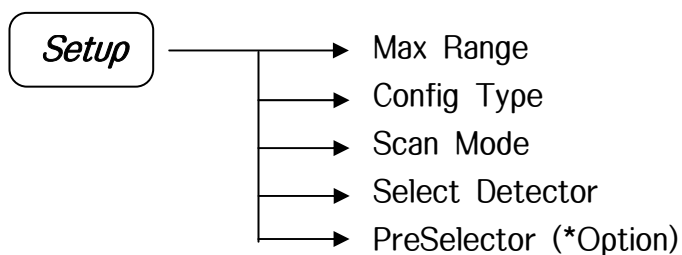


- Scan Mode.. : Measurement ranges divide into multiple ranges, a range that is set for each Scan based on the contents of the proceeding.
- Debug Mode.. : Only Peak detection mode is usable, the user enables to repeatedly sweep the frequency range.
- CISPR Mode : Only a specific frequency which is set by the user, continuous Scan is proceeds.

## Scan Mode

## Entire Set

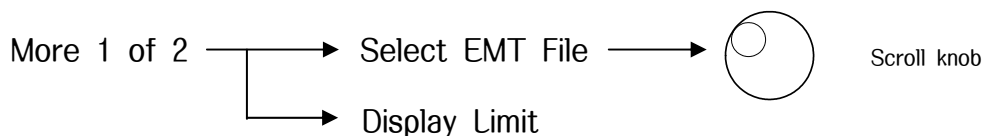
In Scan mode, the whole set in order to use the following press.



- Max Range : Set the number of the entire range. (1~6 Up Currently)
- Config Type : When you select Default, the only action inside the system defaults and when you select Manl, a user specified value is set.
- Scan Mode : Moving a step-interval which is depending on the X axis can be designated as the linear or log scale.
- Select Detector : Positive, Average, Quasi-peak detection mode respectively can be ON / OFF.
- PreSelector : PreSelector built-in can decide whether to use. (Option)

## Display Limit

In Scan mode, in order to display the limit, the user set the following key.



Firstly, press *EMT File* key and select the desired file using knob. Secondly by pressing *Display Limit*, display the limit about the desired detection mode for the screen.

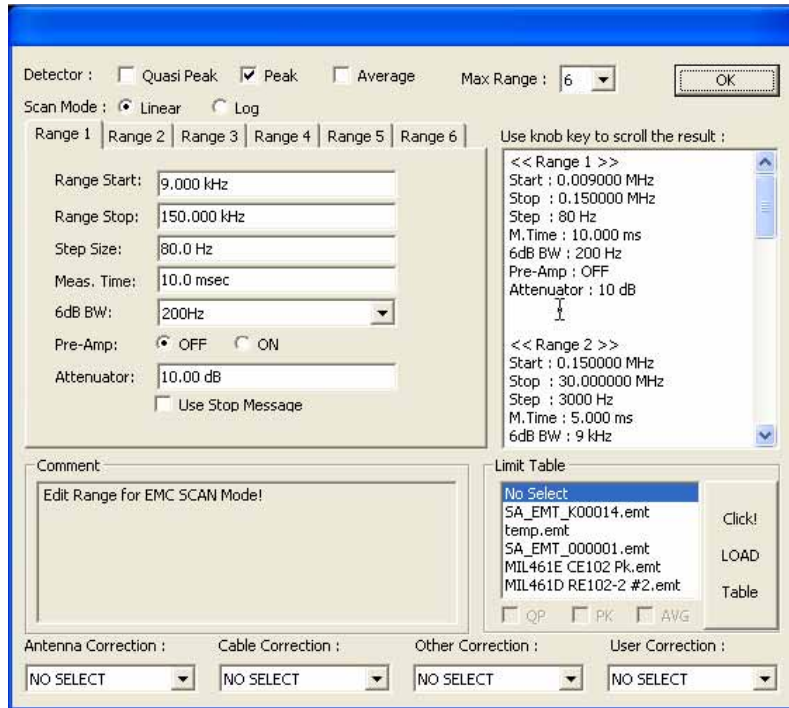
The Limit file creation and editing method refer to Operation Manual of Signal Analyzer.

## Sub-Range Set

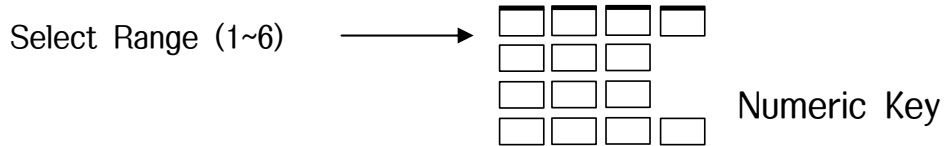
In Scan Mode, Several areas of the measurement range of each zone divided by different settings so that it can be set. In order to set up the sub-range, please note the

following.

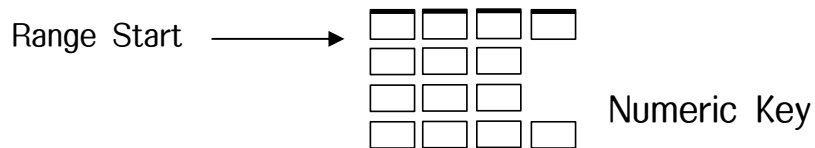
In order to set the details sub-range, press **Control** key and display Config Table box.



To select the area you want to change settings.

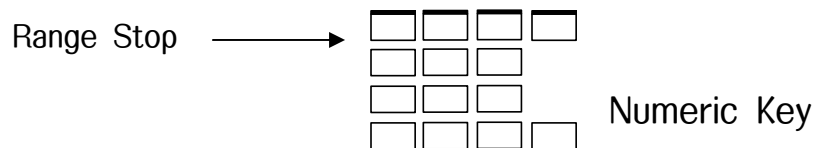


(1) Start Frequency



In EMC mode, available frequencies are 20Hz ~ 3GHz/ 13.2GHz/ 26.5GHz.

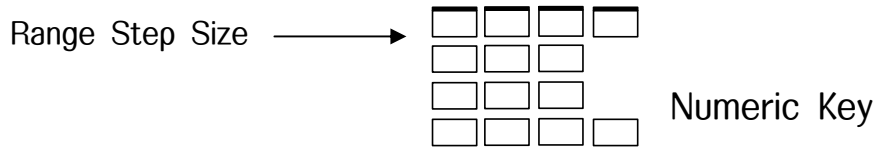
(2) Stop Frequency



In EMC mode, available frequencies are 20Hz ~ 3GHz/ 13.2GHz/ 26.5GHz.

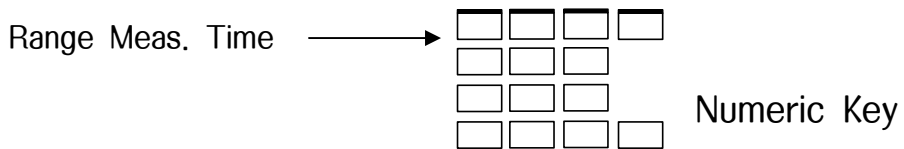
Comment : When setting up a range, we recommended for 30MHz to set boundaries. Including the scope of 30MHz is internally adjustable the ranges.

(3) Step Frequency



Step frequency has a limit. A minimum of 10 Hz to maximum step frequency range. (Stop Freq – Start Freq).

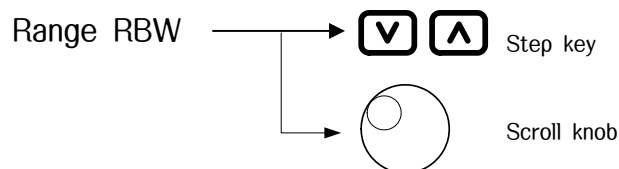
(4) Measurement time



The Measurement Time has constraints, as following table.

	Band A	Band B	Band C/D
Frequency	9 kHz ~ 150 kHz	150 kHz ~ 30 MHz	30 MHz ~ 1GHz
6dB IF BW	200 Hz	9 kHz	120 kHz
Meas. Time (QP Detect)	1sec ~ 100 sec	1sec ~ 100 sec	1sec ~ 100 sec
Meas. Time (Peak, Average)	10 msec ~ 100 sec	1 msec ~ 100 sec	1 msec ~ 100 sec

(5) RBW Filter (6dB IF BW)



IF filter is selectable, depending on the mode detects different kinds.

- QP Detect : 200Hz, 9kHz, 120kHz (3 frequencies)
- Peak, Average Detect : 10Hz, 100Hz, 200Hz, 1kHz, 9kHz, 10kHz, 100kHz, 120kHz, 1MHz, Impulse (1M) (10 frequencies)

(6) Pre-Amp

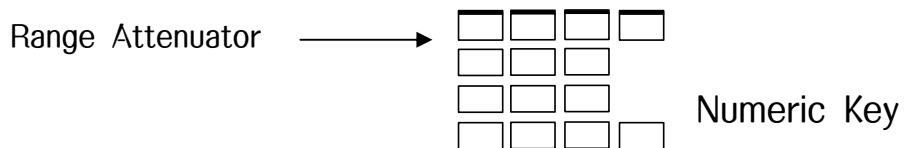
Signal Analyzer basically has the pre-amp which is usable from 1MHz to 3GHz. You can select the pre-amp whether to use.

Range PreAmp [OFF/ON]

Comment : If MW PreAmp option is mounted, the MW PreAmp works above 30MHz frequencies.

(7) Attenuator

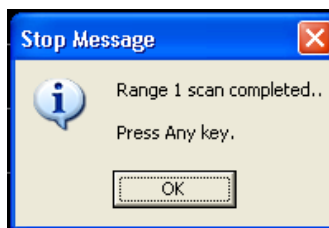
If the input signal is higher than the limit, damage could signal analyzer. In order to attenuate external signal, use the following key.



(8) Scan completed Message

When Sub-range Scan is completed, Notice whether to display the message sets .

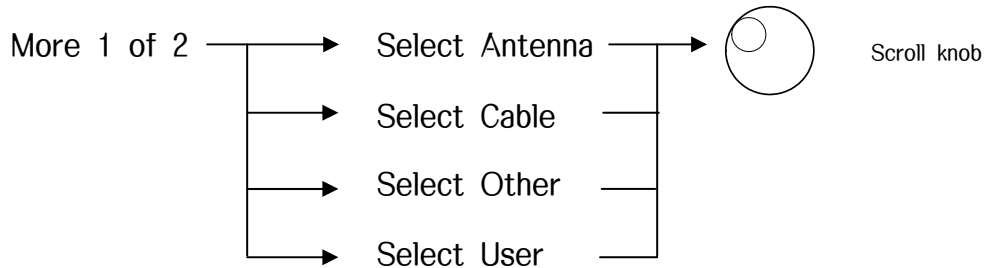
More 1 of 2 → Use Stop Message [OFF/ON]



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(9) Sub-range calibration data set

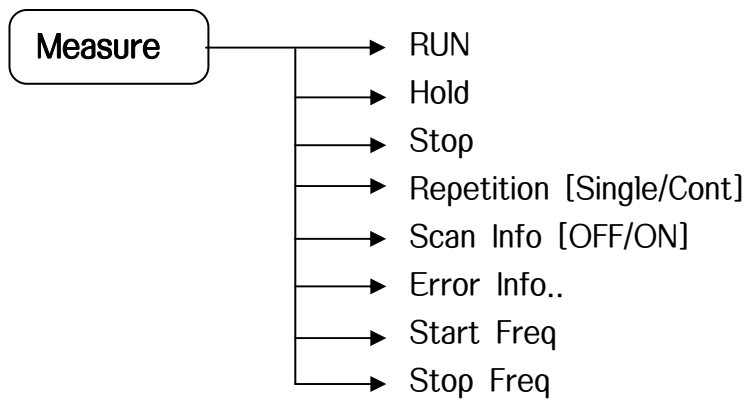
Signal Analyzer includes antennas, cables, other, and user, including four calibration data can be applied.



Calibration data files generated in the amplitude of the signal analyzer's Operation Manual calibration settings section for details.

## Measure

In order to control Scan operation, use the following key.

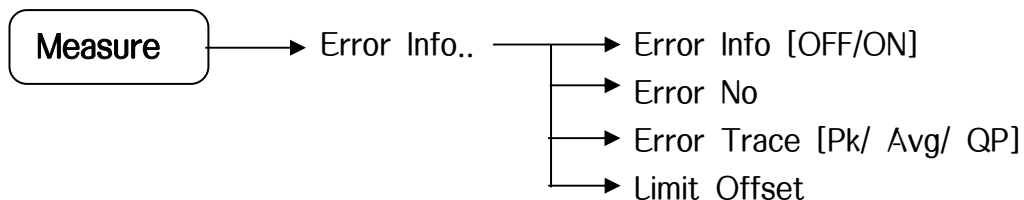


- RUN : Scan from start freq to stop freq.
- Hold : Ongoing action is temporary holded. In order to go back, press RUN key.
- Stop : Ongoing action is temporary stopped.
- Repetition : Scan about whether to repeat the entire range is set.
- Scan Info : Display the location of the information currently in progress.
- Error Info.. : That exceeded the limit information about the location (Error) to set the mark.
- Start Freq : Set the start frequency of Scan.
- Stop Freq : Set the stop frequency of Scan.

Comment : Scan operation is based on the on-screen information for Table Config start frequency of progress in stop frequency.

## Display Error

In order to display about the error information that occurred during the Scan proceeding, use below key.



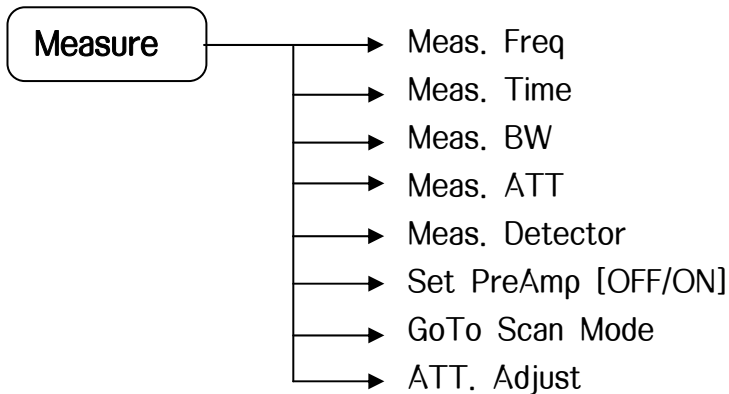
- Error Info : Set whether the display error information window.
- Error No : The number corresponds to the order in which to display the information in error.
- Error Trace : Select the detecting mode to display error information.
- Limit Offset : Depending on the value of high and low levels of investor than the set value judgment errors.

## CISPR Mode

In CISPR Mode, a frequency for continuous measurement is displayed to the screen. In this mode, using specific frequencies of the signal changes can be observed.

## Measure

In order to measure in CISPR mode, use the following key.





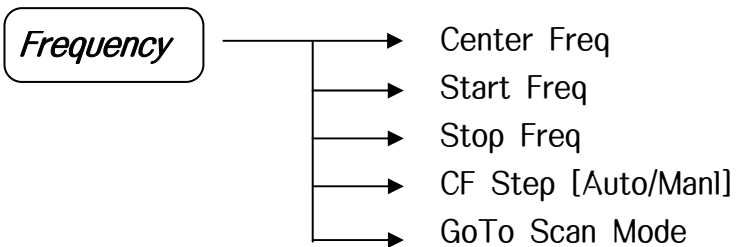
---

## Debug Mode

Debug mode is the normal mode and almost similar to the behavior of the Spectrum mode. Peak portion of the signal is useful when you want to quickly.

## Frequency

The frequency setting menu is displayed.

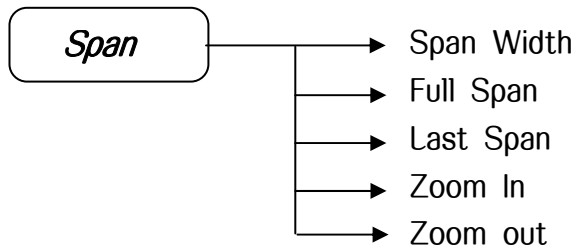


- Center Frequency : Set center frequency.
- Start Frequency : Set start frequency.
- Stop Frequency : Set stop frequency.
- CF Step : The CF step key is to move when the center frequency interval sets.
- GoTo Scan Mode : To move Scan mode directly.

---

## Span

The frequency span setting menu is displayed.

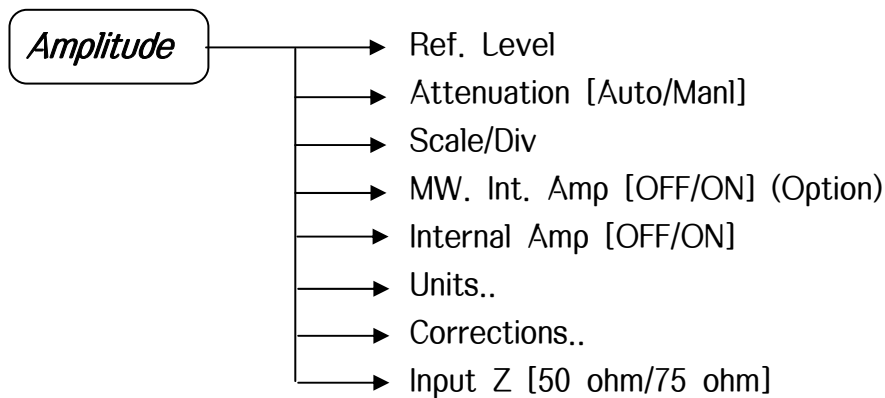


- Span Width : Set span width.
- Full Span : Set maximum span.
- Last Span : Go back previous span.
- Zoom In : Current span is decrease to 1/2.
- Zoom Out : Current span is increase to 2.

---

## Amplitude

The amplitude setting menu is displayed.

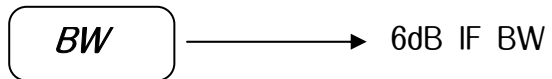


- Ref. Level : Set the reference level.
- Attenuation : Set attenuation level according to input signal.
- Scale/Div : Set the grid spacing in y-axis.
- MW. Int. Amp : Ser MW PreAmp. (MW PreAmp Option)
- Internal Amp : Set internal amplifier.
- Units.. : Change the unit of the reference level.
- Corrections.. : Set the correction value of the measured value.
- Input Z : Set input impedance. (If you want to 75 ohm, must connect the external Pad.)

---

**BW**

6 dB bandwidth of the IF value, which sets the RBW.



- 6dB IF BW : Set RBW value.  
You can select one of the 10/ 100/ 200/ 1k/ 9k/ 10k/  
100k/ 120k/ 1MHz/ Impulse.

---

## Limitations

- Scan mode, the following keys cannot available.

SPAN, In/Out, Trace, Couple, BW, AUX, TUNE, Mkr→, Func

- CISPR mode, the following keys cannot available.

FREQ, SPAN, In/Out, Display, Trace, Limit, Trigger, Couple, BW, AUX, TUNE, Sweep, Single, Marker, Peak, Mkr→, Func

- Debug mode, the following keys cannot available.

MEASURE, Control, In/Out, Trace, Limit, Couple, AUX, TUNE, Mkr→, Func

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## SECTION 4 OPERATING

Read this manual and keep in mind contents before using the EMC measurement.

### EMC Measurements

EMC measurement capability is largely consists of the following three modes.

- Scan mode
- Debug mode
- CISPR Authentication Mode

### SCAN Mode

It is the main modes of the EMC measurement. Refer to the Config Table which is set by user, you can measure the signal from start frequency to stop frequency according to frequency steps. You can use frequency steps by a linear or log scale and set up some parameters (such as detector, range number, range parameter, limit table, correction table) by using a Config EMC table which can be saved by \*.emc type.

EMC equipment can be measured 3 types (positive, average, quasi-peak) detectors at once and displayed in the screen. A TraceA (TraceB, TraceC) becomes positive (average, quasi-peak) detector respectively. You can set up a limit line by detector and compare 3 lines at once.

An enclosed CD with equipment has a manual and sample EMC files.

- EMC Config Table : \*.emc
- EMC Limit Line : \*.emt
- EMC Antenna Factor : \*.ant
- EMC Cable Factor : \*.cbl
- EMC Other Factor : \*.oth
- EMC User Factor : \*.usr

Sample files will be provided to easily modify or reuse. At this point, the contents of each file See Appendix C, the form must be modified to fit.

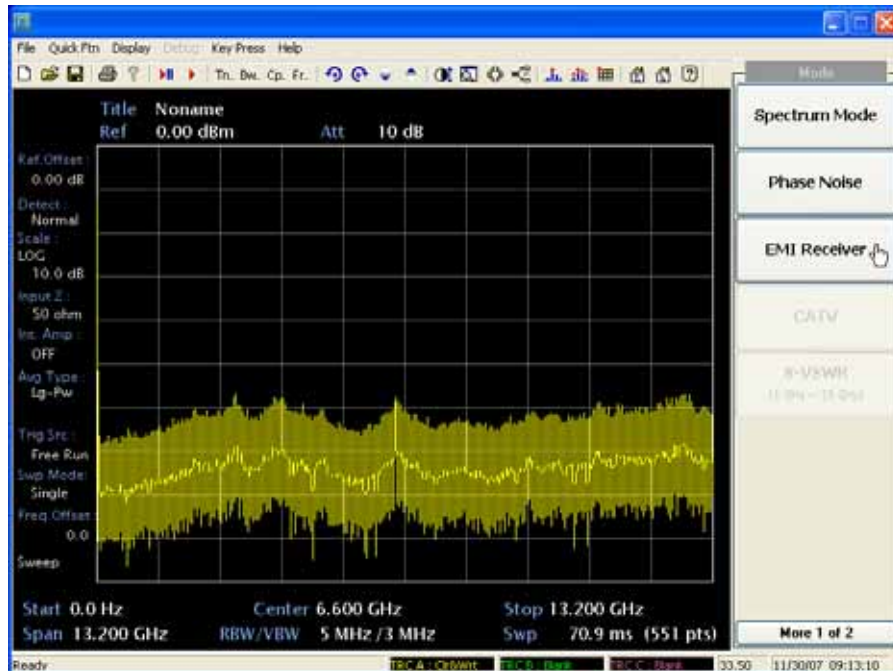
Comment : The EMC files must have related to the E:\UserData folder.

## EMC SCAN mode measurement methods (Example)

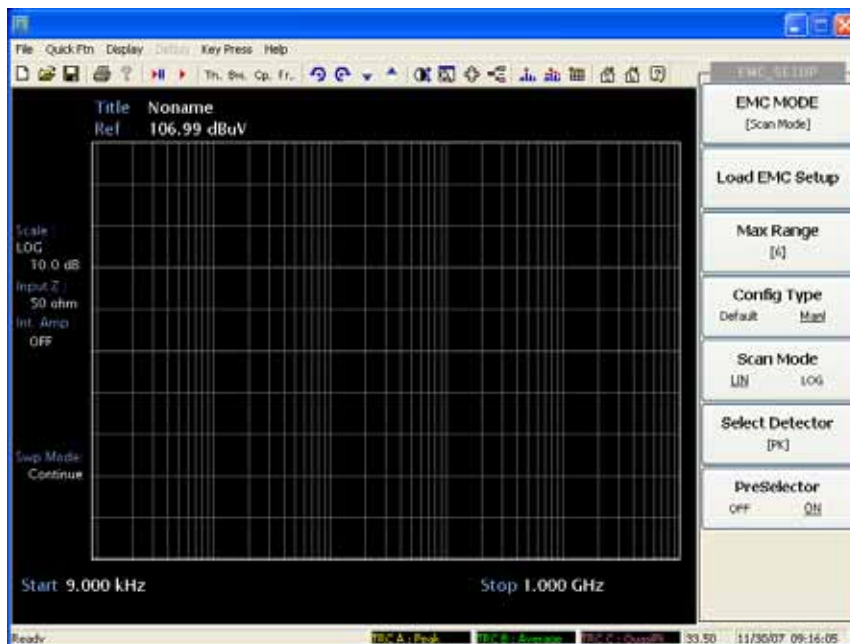
How to EMC Scan mode measurements using Signal analyzers are explained below with examples.

Comment : If you turn on the EMC Receiver Features, EMC Scan mode is a basic state.

1. Press a **MODE** key, EMI Receiver is selected by pressing a EMI Receiver key.

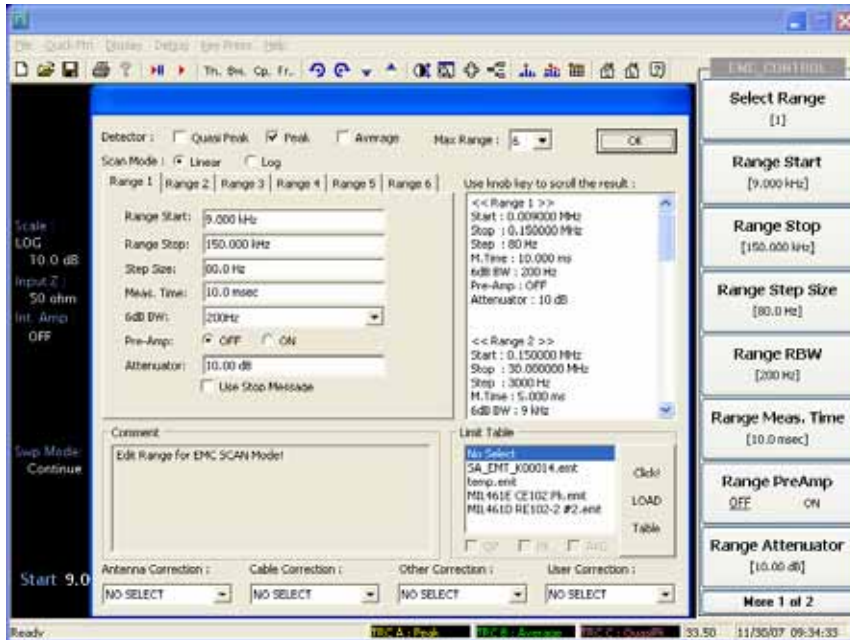


- 
2. EMC entry mode, you press the **Setup** key and Setup menu is displayed. Full Range can be used to measure, Type (Lin / Log) of measurement step and to measure detection modes, and whether to use PreSelector sets. Each setting has already saved files (\*.emc) would put Load EMC Setup could not be questioned immediately.



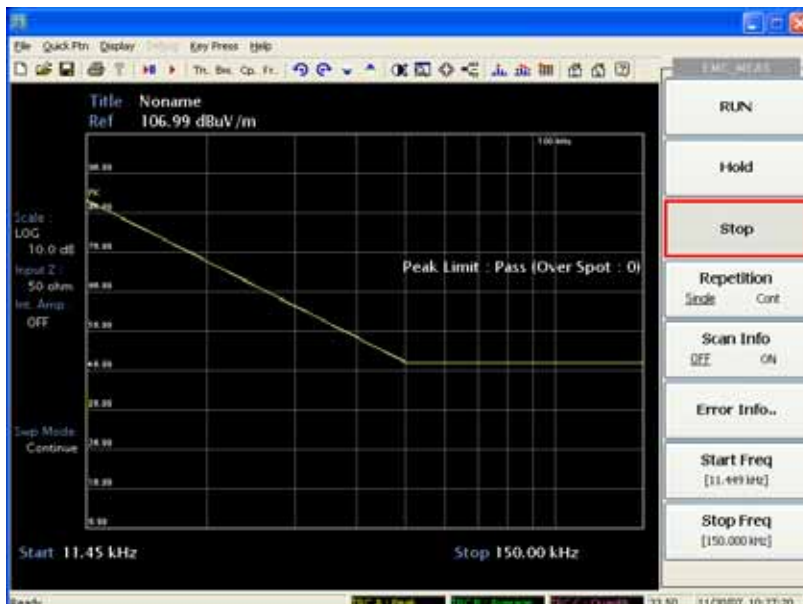
3. Multiple ranges of the target are measured in SCAN mode, divided by the measurement. Each zone can be set up every detail and actual measurements of SCAN have been set with reference to the contents of progress. Possible items for setting are as follows.
- Range Start Frequency : It means the start frequency for the range.
  - Range Stop Frequency : It means the stop frequency for the range.
  - Range Step Frequency : In the internal range, It means intervals for move.
  - Range Measurement Time : Every time you want to use for measuring point in the measurement is indicated.
  - 6dB IF BW Filter : It means IF BW filter.
  - Pre-Amplifier : Whether internal amplifier has been used.
  - Attenuator : Select usable attenuator.
  - Use Stop message : Whether sop message has been displayed.
  - Corrections (Antenna, Cable, Other, User Factor): Each file is used to correct the amplitude of each zone can be specified.

In order to adjust the settings in detail by pressing the **Control** key, and EMC Config Table of contents for each area is changed. To use limit functions, you can use limit file in limit table feature.



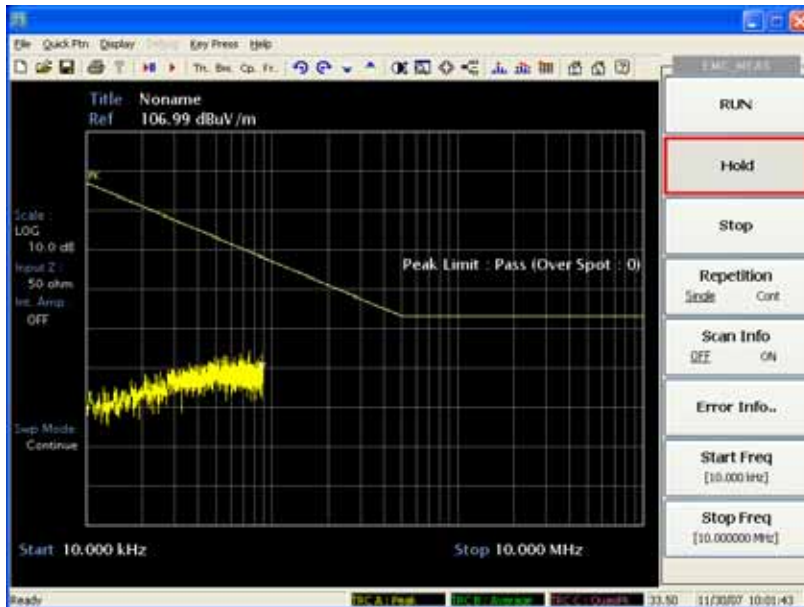
- At the end of measuring preferences menu to display the measurement Measure key press. The actual display screen to start frequency and stop frequency to set up and measurement is started. Press run key.

Comment : The start and stop frequency must remain of the start and stop of the entire area.

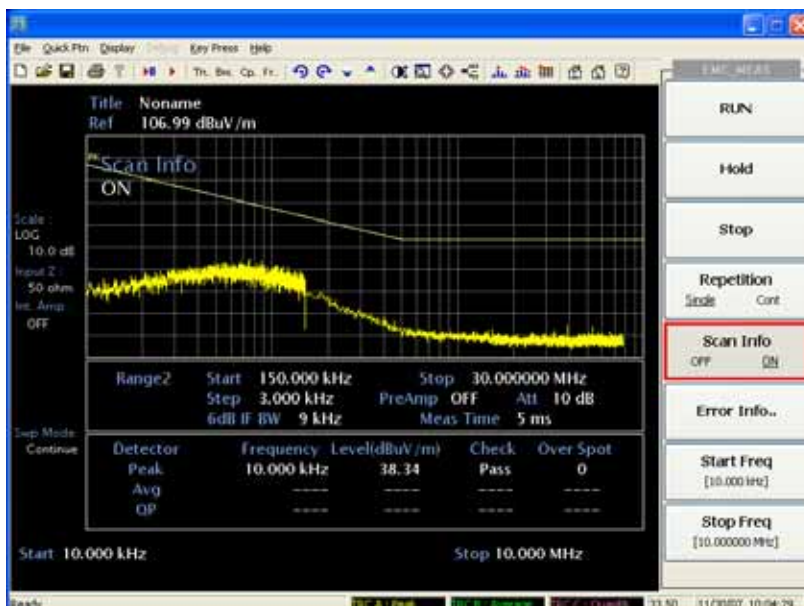


If you want to pause at measurement interval, pause is possible by press Hold key.

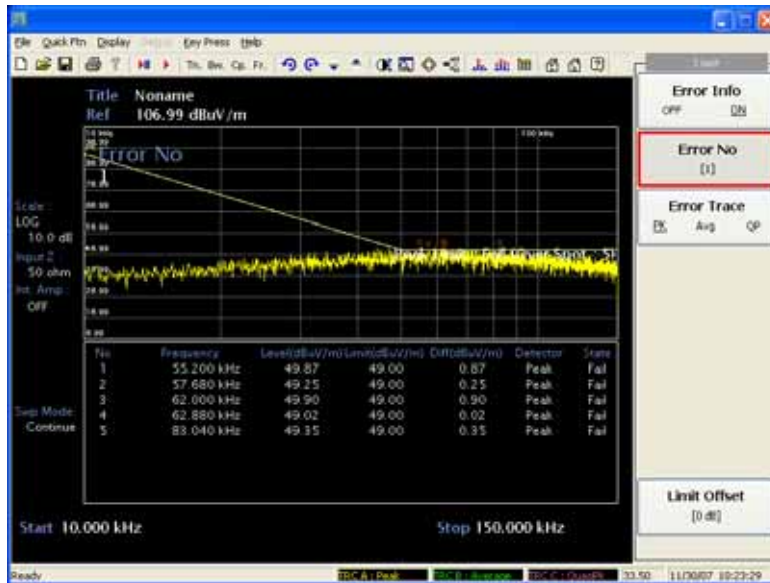
Comment : Hold according to the settings on the screen more visible than it is to import the data.



Press *Scan Info*, You can get information about the current location of progress.



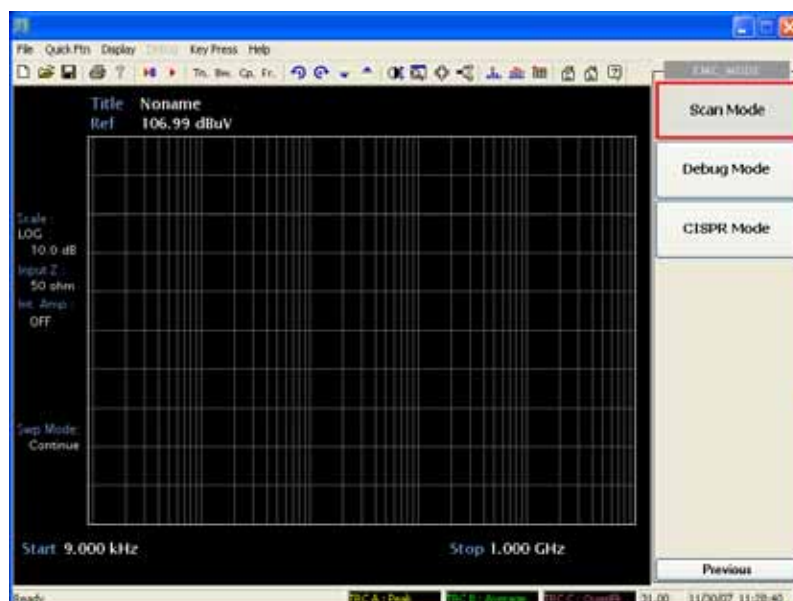
5. Depending on the selected output detection mode, signal is displayed an EMC screen. The limit is selected by comparing the level of signal lines and beyond the point where warranted display of the x. For more information on the display error, press *Error Info* key.



## EMC CISPR Mode Measurement Method (Example)

For below example describes how to detect under a certain frequency of the signal analyzer using Peak, Average, and Quasi-peak value.

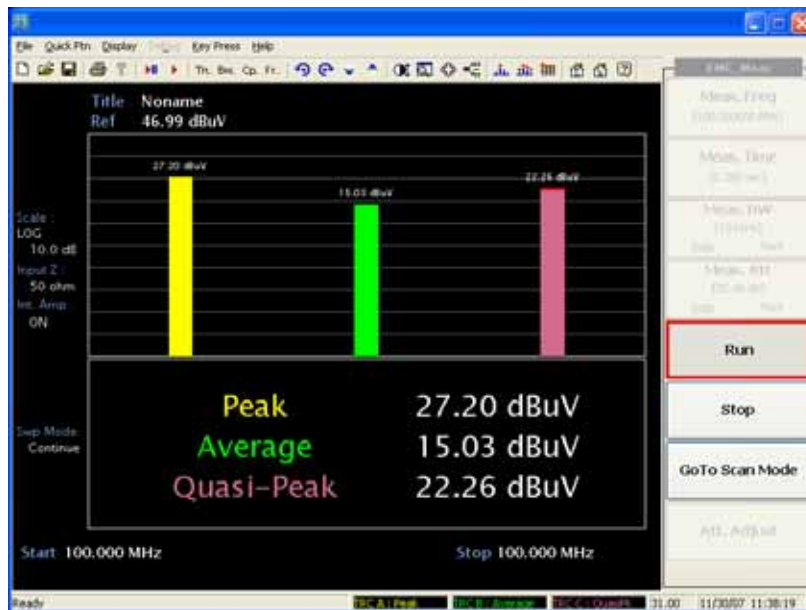
1. Set up **MODE** key and then press enter EMC mode. Set up EMC Mode key and press **CISPR Mode** then CISPR mode.



2. Select measuring frequency, measuring BW filter and attenuator. In order to change the detection mode and preamp, the menu appears when press **Control** key.



3. The **Measurement** key underlying measure is initiated by pressing the Run key.



4. If you want to stop measure, press **Stop** key.

## EMC Debug Mode Measurement Method

EMC Debug mode is normal mode of behavior Spectrum mode because the same methods. For more information, please refer to signal analyzer's Operation Manual

Comment : EMC mode, the Spectrum mode BW Unlike 3 db filter instead of the 6 db IF filter is used.

---

## SECTION 5 DETAILED DESCRIPTION OF COMMANDS

### General Description

This section gives detailed descriptions of the device messages for the signal analyzer in functional order.

#### *SA Command*

#### *SCPI Command*

	Command Name
■ Function	Here is the explanation of the command.
■ Remote Command	SA Command $\Delta$ sw SA Command $\Delta$ f SA Command? SCPI Command $\Delta$ sw SCPI Command $\Delta$ f SCPI Command? ( $\Delta$ : Blank)
■ 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**      *RL*Δ*f*  
                                  *RL?*  
                                  :*DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel*Δ*f*  
                                  :*DISPlay:WINDow:TRACe:Y[:SCALe]:RLEVel?*
  
- **Response Message**      Reference Level (dBm)
  
- **Value of f**                    -170dBm to 30dBm (Step : 0.01dBm)
  
- **Suffix code**                None     : dBm  
                                  DBM     : dBm  
                                  DBMV   : dBmV  
                                  DBUV   : dBuV  
                                  DBMA   : dBmA  
                                  DBUA   : dBuA  
                                  V       : V  
                                  MV       : mV (10<sup>-3</sup> V)  
                                  UV       : uV (10<sup>-6</sup> V)  
                                  NV       : nV (10<sup>-9</sup> V)  
                                  PV       : pV (10<sup>-12</sup> V)  
                                  W       : W  
                                  MW       : mW (10<sup>-3</sup> W)  
                                  UW       : uW (10<sup>-6</sup> W)  
                                  NW       : nW (10<sup>-9</sup> W)  
                                  PW       : pW (10<sup>-12</sup> 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 0 dBm

Example RL 10;  
 RL 30DBM;  
 RL ?;  
 DISP:WIND:TRAC:Y:RLEV 10;  
 DISP:WIND:TRAC:Y:RLEV 30DBM;  
 DISP:WIND:TRAC:Y:RLEV?;

*AT*

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

#### Attenuation (Only Debug / CISPR Mode)

- Function Sets the amount of attenuation for the input attenuator.
- Remote Command
  - AT $\Delta$ f
  - AT?
  - [:SENSe]:POWer[:RF]:ATTenuation $\Delta$ f
  - [:SENSe]:POWer[:RF]:ATTenuation?
- Response Message the amount of attenuation (dB)
- Value of f 0dB to 55dB (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 (Only Debug Mode)**

- **Function**                      Sets input attenuation mode to the auto mode or the manual mode. If the auto mode is selected, the amount of attenuation is adjusted automatically. If the manual mode is selected, this affects Reference Level.
  
- **Remote Command**            ATA $\Delta$ n  
                                  ATA $\Delta$ sw  
                                  ATA?  
                                  [:SENSe]:POWer[:RF]:ATTenuation:AUTO $\Delta$ n  
                                  [:SENSe]:POWer[:RF]:ATTenuation:AUTO $\Delta$ 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 $\Delta$ f  
                              SD?  
                              :DISPlay:LPLot:WINDow:TRACe:Y[:SCALe]:PDIVision $\Delta$ f  
                              :DISPlay:LPLot:WINDow:TRACe:Y[:SCALe]:PDIVision?
  
- Response Message      Scale/Divide (dB/div)
  
- Value of f                0.1dB to 1dB (step : 0.1dB)  
                              1dB to 20dB (step : 1dB)
  
- 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 (Only Debug / CISPR Mode)

- Function Activates the internal amplifier.
  
- Remote Command IA $\Delta$ n  
IA $\Delta$ sw  
IA?  
[:SENSe]:POWer[:RF]:GAIN[:STaTe] $\Delta$ n  
[:SENSe]:POWer[:RF]:GAIN[:STaTe] $\Delta$ 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, Only Debug / CISPR Mode)

- Function Activates the internal amplifier(MW-LNA).

- 
- Remote Command    IA $\Delta$ n  
                           IA $\Delta$ sw  
                           IA?  
                           [:SENSe]:POWer[:RF]:GAIN[:STATe] $\Delta$ n  
                           [:SENSe]:POWer[:RF]:GAIN[:STATe] $\Delta$ 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 State (Only Debug Mode)**

- Function             Selects all correction(1:Antenna, 2:Cable, 3:Other, 4:User) state to ON or OFF.
  
- Remote Command    COAS $\Delta$ n

- 
- COAS $\Delta$ sw
  - COAS?
  - [[:SENSe]:CORRection:CSET:ALL[:STATe] $\Delta$ n
  - [[:SENSe]:CORRection:CSET:ALL[:STATe] $\Delta$ 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 (Only Debug Mode)**

- Function              Selects correction state to ON or OFF.  
                          (1:Antenna, 2:Cable, 3:Other, 4:User)
  
- Remote Command    COA1|2|3|4 $\Delta$ 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 Correction OFF (Only Debug Mode)**

- Function             Sets all correction state 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 (Only Debug / CISPR Mode)

- **Function** Sets the RBW value.
- **Remote Command** RB $\Delta$ f  
RB?  
[:SENSe]:BANDwidth|BWIDth[:RESolution] $\Delta$ 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 (Only Debug Mode)

- **Function** Sets the 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 (Only Debug Mode)

- **Function**                      Sets the amplitude of Display Line.
  
- **Remote Command**      DL $\Delta$ f  
                                 DL?  
                                 :DISPlay:WINDow:TRACe:Y:DLINe $\Delta$ f  
                                 :DISPlay:WINDow:TRACe:Y:DLINe?
  
- **Response Message**      Amplitude of Display Line
  
- **Value of f**                      Reference Level to (Reference Level-10\*Scale/DIV)  
                                 (Step : 0.01dBm)
  
- **Suffix code**                      None      : dBm  
                                 DBM      : dBm  
                                 DBMV    : dBmV  
                                 DBUV    : dBuV  
                                 DBMA    : dBmA  
                                 DBUA    : dBuA  
                                 V        : V  
                                 MV       : mV (10<sup>-3</sup> V)  
                                 UV       : uV (10<sup>-6</sup> V)  
                                 NV       : nV (10<sup>-9</sup> V)  
                                 PV       : pV (10<sup>-12</sup> V)  
                                 W        : W  
                                 MW       : mW (10<sup>-3</sup> W)  
                                 UW       : uW (10<sup>-6</sup> W)  
                                 NW       : nW (10<sup>-9</sup> W)  
                                 PW       : pW (10<sup>-12</sup> W)  
                                 FW       : fW (10<sup>-15</sup> 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 (Only Debug Mode)

- Function              Turns Display Line to 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 (Only Debug Mode)

- Function Sets the threshold level and ignores data below this value.
- Remote Command
  - TH $\Delta$ f
  - TH?
  - :DISPlay:WINDow:TRACe:Y:TLINe $\Delta$ f
  - :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
  - DBMV : dBmV
  - DBUV : dBuV
  - DBMA : dBmA
  - DBUA : dBuA
  - V : V
  - MV : mV ( $10^{-3}$  V)

---

UV :  $\mu\text{V}$  ( $10^{-6}$  V)  
 NV :  $\text{nV}$  ( $10^{-9}$  V)  
 PV :  $\text{pV}$  ( $10^{-12}$  V)  
 W : W  
 MW :  $\text{mW}$  ( $10^{-3}$  W)  
 UW :  $\mu\text{W}$  ( $10^{-6}$  W)  
 NW :  $\text{nW}$  ( $10^{-9}$  W)  
 PW :  $\text{pW}$  ( $10^{-12}$  W)  
 FW :  $\text{fW}$  ( $10^{-15}$  W)  
 A : A  
 MA :  $\text{mA}$  ( $10^{-3}$  A)  
 UA :  $\mu\text{A}$  ( $10^{-6}$  A)  
 NA :  $\text{nA}$  ( $10^{-9}$  A)  
 PA :  $\text{pA}$  ( $10^{-12}$  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 (Only Debug Mode)

■ Function              Turns Threshold Line to ON or OFF.

■ Remote Command    THS $\Delta$ n  
                             THS $\Delta$ sw  
                             THS?  
                             :DISPlay:WINDow:TRACe:Y:TLINe:STATe $\Delta$ n  
                             :DISPlay:WINDow:TRACe:Y:TLINe:STATe $\Delta$ 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 (Only Debug Mode)

■ 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 SignalAnalyzer;  
TITLE?;  
DISP:ANN:TITL:DATA SignalAnalyzer;  
DISP:ANN:TITL:DATA?;

**GRAT**

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

**Graticule (Only Scan / Debug Mode)**

- 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 the white mode to 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 which 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

- 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
- 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** FRENAMEx△'src\_file\_name','dest\_file\_name'  
:MMEMory:MOVEx△'src\_file\_name','dest\_file\_name'
- **Value of src\_file\_name, dest\_file\_name**  
File Path + File Name
- **Example**  
FRENAMEx 'C:\demo1.emc','C:\demo1\_1.emc';  
FRENAMEx '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 Received Binary Data of Selected File. Maximum Size of Sended File is 2MByte, and Maximum Size of Received File is 30MByte.
- **Remote Command** FMOVEx△'file\_name',definite\_length\_block  
FMOVE?x△'file\_name'  
MMEMory:DATAx△'file\_name',definite\_length\_block  
MMEMory:DATA?x△'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 (Only Debug / CISPR Mode)

- **Function** Sets the center frequency. If the center frequency is set to near the frequency of boundary, the span value would not be satisfied. In case of this, the span value would be adjusted automatically.
- **Remote Command** CF $\Delta$ f  
CF?  
[:SENSe]:FREQuency:CENTer $\Delta$ 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 (Only Scan / Debug Mode)**

- **Function** Sets the start frequency. If the start frequency is set to near the frequency of boundary, the span value would not be satisfied. In case of this, the span value would be adjusted automatically
  
- **Remote Command** FA $\Delta$ f  
FA?  
[:SENSe]:FREQuency:STARt $\Delta$ 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<sup>0</sup>)  
HZ : Hz (10<sup>0</sup>)  
KHZ : kHz (10<sup>3</sup>)  
MHZ : MHz (10<sup>6</sup>)  
GHZ : GHz (10<sup>9</sup>)
  
- **Example** FA 123456;  
FA 50MHZ;  
FA?;  
FREQ:STAR 123456;  
FREQ:STAR 50MHZ;  
FREQ:STAR?;

*FB*

*[[:SENSe]:FREQuency:STOP*

**Stop Frequency (Only Scan / Debug Mode)**

- 
- **Function**                      Sets the stop frequency. If the stop frequency is set to near the frequency of boundary, the span value would not be satisfied. In case of this, the span value will be adjusted automatically.
  - **Remote Command**      FB $\Delta$ f  
                                     FB?  
                                     [:SENSe]:FREQuency:STOP $\Delta$ 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<sup>0</sup>)  
   HZ       : Hz (10<sup>0</sup>)  
   KHZ     : kHz (10<sup>3</sup>)  
   MHZ     : MHz (10<sup>6</sup>)  
   GHZ     : GHz (10<sup>9</sup>)
  - **Example**                        FB 123456;  
   FB 50MHZ;  
   FB?;  
   FREQ:STOP 123456;  
   FREQ:STOP 50MHZ;  
   FREQ:STOP?;

**SS**

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

**CF Step (Only Debug Mode)**

- **Function**                      Sets the center frequency step size.
- **Remote Command**      SS $\Delta$ f

---

SS?  
[:SENSe]:FREQUency:CENTer:STEP[:INCRement]Δf  
[: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<sup>0</sup>)  
HZ : Hz (10<sup>0</sup>)  
KHZ : kHz (10<sup>3</sup>)  
MHZ : MHz (10<sup>6</sup>)  
GHZ : GHz (10<sup>9</sup>)
- 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 (Only Debug Mode)

- Function Sets the cf step to the auto mode or the manual mode.
- Remote Command  
SSAΔn  
SSAΔsw  
SSA?  
[:SENSe]:FREQUency:CENTer:STEP:AUTOΔn  
[:SENSe]:FREQUency:CENTer:STEP:AUTOΔsw

---

[[: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 (Only Scan / Debug Mode)

- **Function** Turns the limit line checking to 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 (Only Scan / Debug Mode)

- 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 (Only Scan / Debug Mode)

- 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 (Only Scan / Debug Mode)**

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

#### **[Reference]**

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

---

## Marker

*MS[1~9]*

*:CALCulate:MARKer[1~9]:STATe*

### Marker State (Only Scan / Debug Mode)

- 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 (Only Scan / Debug Mode)

- **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 (Only Scan / Debug Mode)

- **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]Δf  
MF[1~9]?  
:CALCulate:MARKer[1~9]:XΔf  
:CALCulate:MARKer[1~9]:X?
- Response Message Marker Frequency (Hz)
- Value of f Start Frequency to Stop Frequency
- Suffix code  
None : Hz (10<sup>0</sup>)  
HZ : Hz (10<sup>0</sup>)  
KHZ : kHz (10<sup>3</sup>)  
MHZ : MHz (10<sup>6</sup>)  
GHZ : GHz (10<sup>9</sup>)
- 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 (Only Scan / Debug Mode)**

- 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 (Only Scan / Debug Mode)**

■ 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 (Only Debug Mode)**

- **Function**                      Sets the marker table state.
  
- **Remote Command**      MTB $\Delta$ n  
                                  MTB $\Delta$ sw  
                                  MTB?  
                                  :CALCulate:MARKer:TABLE:STATE $\Delta$ n  
                                  :CALCulate:MARKer:TABLE:STATE $\Delta$ 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 (Only Scan / Debug Mode)**

- **Function**                      Turns off All of the marker.

---

■ Remote Command    MAO  
                          :CALCulate:MARKer:AOff

■ Example             MAO;  
                          CALC:MARK:AOff;

---

## Measurement

*MEA*

*:MEASure:START*

### Measure Start

- Function Starts the measurement.
- Remote Command MEA $\Delta$ sw  
MEA?  
:MEASure:STARt $\Delta$ 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?;

### [Reference]

You can insert Data of EMC Config after loading EMC Config File(\*.emc) in SCAN Mode.

---

## Meas. Control

### *SCAN*

*:MEASure:SCAN*

#### Scan (Only Scan Mode)

- Function Starts or Stop 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 (Only Scan Mode)

- Function                    Sets Run Type to Single or Continuous.
- Remote Command        RTYPE $\Delta$ 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 (Only Scan Mode)

- Function                    Sets Scan Info to ON or OFF.
- Remote Command        SINFO $\Delta$ n  
SINFO $\Delta$ 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 $\Delta$ sw  
                                      MODE?  
                                      :INSTrument[:SElect] $\Delta$ 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 (Only Scan Mode)

- 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 (Only Scan Mode)

- 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 (Only Scan Mode)**

- Function              Sets Freq Step of Scan Mode.
- Remote Command    FSTEP $\Delta$ 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 (Only Scan / CISPR Mode)**

- Function              Sets Peak Detector to ON or OFF.
- Remote Command    DETPK $\Delta$ n  
                             DETPK $\Delta$ sw  
                             DETPK?
- Response Message   1            : ON

- 
- 0 : OFF
  - Value of n      1 : ON  
                      0 : OFF
  - Value of sw     ON : ON  
                      OFF : OFF
  - Initial setting    0
  - Example            DETPK 1;  
                          DETPK ON;  
                          DETPK?;

### *DETAV*

#### **Average Detector (Only Scan / CISPR Mode)**

- 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      1
- Example            DETAV 1;  
                          DETAV ON;  
                          DETAV?;

---

## *DETQP*

### Quasi-Peak Detector (Only Scan / CISPR Mode)

- Function                    Sets Quasi-Peak Detector to ON or OFF.
  
- Remote Command        DETQP $\Delta$ n  
                              DETQP $\Delta$ 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?;

## *PRESELECTOR*

### Pre-Selector (Option, Only Scan / CISPR Mode)

- Function                    Sets Pre-Selector to ON or OFF.
  
- Remote Command        PRESELECTOR $\Delta$ n  
                              PRESELECTOR $\Delta$ sw  
                              PRESELECTOR?
  
- Response Message      1            : ON  
                              0            : OFF

---

■ Value of n            1        : ON  
                             0        : OFF

■ Value of sw           ON       : ON  
                             OFF      : OFF

■ Initial setting        0

■ Example                PRESELECTOR 1;  
                              PRESELECTOR ON;  
                              PRESELECTOR?;

---

## Peak Search

### *MPK[1~9]*

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

#### Peak Search (Only Scan / Debug Mode)

- **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 (Only Scan / Debug Mode)

- **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 (Only Scan / Debug Mode)

- **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]:MAXimum:RIGHT***

### Next Right Peak Search (Only Scan / Debug Mode)

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

***MPKM***  
***:CALCulate:MARKer[1~9]:MINimum***

### Minimum Search (Only Scan / Debug Mode)

- **Function** Places the selected marker on the minimum level point of the marker trace.

- 
- Remote Command MPKM[1~9]  
:CALCulate:MARKer[1~9]:MINimum

- Example MPKM;  
MPKM5;  
CALC:MARK:MIN;  
CALC:MARK5:MIN;

### ***MPKP***

***:CALCulate:MARKer[1~9]:PTPeak***

#### **Peak to Peak Search (Only Scan / Debug Mode)**

- 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 (Only Scan / Debug Mode)**

- Function Sets the multi peak number.
- Remote Command MKPKN $\Delta$ n  
MKPKN?  
:CALCulate:MARKer:PEAK:MULTi:NUMBER $\Delta$ 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 (Only Scan / Debug Mode)**

- 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 (Only Scan / Debug Mode)**

- Function                Sets the multi peak trace.
- Remote Command        MKPKT△n  
                              MKPKT?

- 
- :CALCulate:MARKer:PEAK:MULTi:TRACe $\Delta$ 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 (Only Scan / Debug Mode)**

- Function                Sets the peak least amplitude for peak search.  
                              It is valid when MPKPA is set to PAR.
- Remote Command      MPKE $\Delta$ f  
                              MPKE?  
                              :CALCulate:MARKer:PEAK:EXCursion $\Delta$ f  
                              :CALCulate:MARKer:PEAK:EXCursion?
- Response Message    Marker Peak Search Excursion (dB)
- Value of f              0.03dB to 210dB
- 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 (Only Scan / Debug Mode)**

- **Function** Sets the low limit line for peak search.  
It is valid when MPKPA is set to PAR.
  
- **Remote Command** MPKTH $\Delta$ f  
MPKTH?  
:CALCulate:MARKer:PEAK:THReshold $\Delta$ f  
:CALCulate:MARKer:PEAK:THReshold?
  
- **Response Message** Marker Peak Search Threshold (dBm)
  
- **Value of f** Ref level to -210dB
  
- **Suffix code**
  - None : dBm
  - DBM : dBm
  - DBMV : dBmV
  - DBUV : dBuV
  - DBMA : dBmA
  - DBUA : dBuA
  - V : V
  - MV : mV ( $10^{-3}$  V)
  - UV :  $\mu$ V ( $10^{-6}$  V)
  - NV : nV ( $10^{-9}$  V)
  - PV :  $\mu$ V ( $10^{-12}$  V)
  - W : W
  - MW : mW ( $10^{-3}$  W)
  - UW :  $\mu$ W ( $10^{-6}$  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 (Only Scan / Debug Mode)**

- 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?;

---

## 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 (Only Debug Mode)

- **Function** Sets the span.
- **Remote Command** SP $\Delta$ f  
SP?  
[:SENSe]:FREQuency:SPAN $\Delta$ 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 (Only Debug Mode)

- **Function** Sets the full span.
- **Remote Command** FS  
*[::SENSe]:FREQuency:SPAN:FULL*
- **Example** FS;  
FREQ:SPAN:FULL;

## *LS*

*[::SENSe]:FREQuency:SPAN:PREVious*

### Last Span (Only Debug Mode)

- **Function** Changes to two times the previous span. Span is varied in the range that allows holding the center frequency.
- **Remote Command** LS  
*[::SENSe]:FREQuency:SPAN:PREVious*
- **Example** LS;  
FREQ:SPAN:PREV;

## *ZI*

*[::SENSe]:FREQuency:SPAN:ZIN*

### Zoom-In (Only Debug Mode)

- **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 (Only Debug Mode)**

- 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 (Only Debug / CISPR Mode)

- **Function** Sets the sweep time or measurement time.
- **Remote Command** ST $\Delta$ f  
ST?  
[:SENSe]:SWEep:TIME $\Delta$ f  
[:SENSe]:SWEep:TIME?
- **Response Message** Sweep Time (s)
- **Value of f** 5 ms to 2000 s : Sweep mode  
1  $\mu$ s 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 :  $\mu$ s ( $10^{-6}$ )  
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 (Only Debug Mode)

- **Function** Sets the sweep time mode to the auto mode or the 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 acting sweep
- Remote Command        CO  
                                  :INITiate:CONTinuous
- Example                    CO;  
                                  INIT:CONT;

*SI*

*:INITiate[:IMMediate]*

### Single Sweep

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

---

## System

### *BEEP*

#### Beep

- Function                    Turns Beep to 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 to ON or OFF when controlled by hyper terminal..

- 
- 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 (Only Debug Mode)

- **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 (Only Scan Mode)**

- **Function**                      Queries the scan level data. in Scan Mode
  
- **Remote Command**        TRD? $\Delta$ sw  
                                      :TRACe[:DATA]? $\Delta$ 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 (Only Scan Mode)**

- **Function**                      Queries the scan frequency data. in Scan Mode
  
- **Remote Command**        TRD? $\Delta$ sw  
                                      :TRACe[:DATA]? $\Delta$ 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 (Only Debug Mode)

- Function                Sends the trace data or Queries the trace data. The number of Send/Query Data is changed depend on Sweep Point.
- Remote Command        TRD $\Delta$ sw,data1,data2,data3.....  
                              TRD? $\Delta$ sw  
                              :TRACe[:DATA] $\Delta$ sw  
                              :TRACe[:DATA]? $\Delta$ 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 (Only CISPR Mode)

- 
- **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 $\Delta$ sw  
TSO?  
:TRIGger[:SEQuence]:SOURce $\Delta$ 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 Command

### *\*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        \*ESE $\Delta$ n  
\*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 was completed.
- 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 been 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    \*SRE $\Delta$ n  
                              \*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 Command - 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** ESE2△n  
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 been completed (Peak search, OBW, X dB, Noise marker, Freq. Counter, Limit Pass/Fail..)
3	8	AUTO TUNE completed	AUTO TUNE has been completed.
2	4	Averaging completed	Sweeping according to the specified AVERAGE number has been completed.
1	2	Calibration completed	Temp Cal, Pre-Filter Cal, ZNC Cal., Level Cal. has been completed.
0	1	Sweep completed	A single sweep has been completed or is in standby.

- Example                    ESR2?;

**ERR**

***:SYSTem:ERRor[:NEXT]***

**Error Code**

- Function                    Returns the error code of the current function. And the error code is cleared.
- Remote Command        ERR?  
                                  :SYSTem:ERRor[:NEXT]?
- Response Message        Error Code
- Example                    ERR?;  
                                  SYST:ERR?

# APPENDIX A – Remote Command

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Frequency	Start Frequency	FA	[:SENSe]:FREQuency:STARt	<frequency> ?	5-27
Frequency	Stop Frequency	FB	[:SENSe]:FREQuency:STOP	<frequency> ?	5-27
Frequency	CF Step	SS	[:SENSe]:FREQuency:CENTer:STEP[:INCRement]	<frequency> ?	5-28
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Limit Line	Pass/Fail Alarm	ALARM	:CALCulate:LLINe:ALARm	OFF ON 0 1 ?	5-32
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Marker	Marker Mode	MM[1-9]	:CALCulate:MARKer[1-9]:MODE	POsition DELTA OFF ?	5-35
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Marker	Marker Amplitude	MA[1-9]	:CALCulate:MARKer[1-9]:Y	?	5-36
Marker	Marker Trace	MT[1-9]	:CALCulate:MARKer[1-9]:TRACe	1 2 3 ?	5-37
Marker	Marker Table	MTB	:CALCulate:MARKer:TABLE:STATe	OFF ON 0 1 ?	5-38
Marker	Marker All Off	MAO	:CALCulate:MARKer:AOFF	none	5-38
Measurement	Meas. Start	MEA	:MEASure:STARt	SCAN DEBUG CISPR ?	5-40
Meas - Control	Scan	SCAN	:MEASure:SCAN	RUN HOLD STOP ?	5-41
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Control					
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Mode - Setup	Detector - Average	DETAV		OFF ON 0 1 ?	5-47
Mode - Setup	Detector - QuasiPeak	DETPQ		OFF ON 0 1 ?	5-48
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Peak Search	Next Left Peak Search	MPKL[1-9]	:CALCulate:MARKer[1-9]:MAXimum:LEFT	none	5-50
Peak Search	Next Right Peak Search	MPKR[1-9]	:CALCulate:MARKer[1-9]:MAXimum:RIGHT	none	5-51
Peak Search	Minimum Search	MPKM[1-9]	:CALCulate:MARKer[1-9]:MINimum	none	5-51
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Peak Search	Multi Peak Number	MMPKN	:CALCulate:MARKer:PEAK:MULTi:NUMBER	<integer> ?	5-52
Peak Search	Multi Peak	MMPK	:CALCulate:MARKer:PEAK:MULTi	none	5-53
Peak Search	Multi Peak Trace	MMPKT	:CALCulate:MARKer:PEAK:MULTi:TRACe	<integer> ?	5-53
Peak Search	Peak Excursion	MPKE	:CALCulate:MARKer:PEAK:EXCURsion	<amplitude> ?	5-54
Peak Search	Peak Threshold	MPKTH	:CALCulate:MARKer:PEAK:THREshold	<amplitude> ?	5-55
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Span	Last Span	LS	[:SENSe]:FREQUency:SPAN:PREVious	none	5-61
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Sweep	Single	SI	:INITiate[:IMMediate]	none	5-65
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Common	*ESR	*ESR	*ESR	?	5-75
Common	*IDN	*IDN	*IDN	?	5-76
Common	*OPC	*OPC	*OPC	?	5-76
Common	*RST	*RST	*RST	none	5-77
Common	*SRE	*SRE	*SRE	<integer> ?	5-77

Common	*STB	*STB	*STB	?	5-77
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Common	*IDN	*IDN	*IDN	?	5-76
Common	*OPC	*OPC	*OPC	?	5-76
Common	*RST	*RST	*RST	none	5-77
Common	*SRE	*SRE	*SRE	<integer> ?	5-77
Common	*STB	*STB	*STB	?	5-77
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Mode - Setup	Detector - Peak	DETPK		OFF ON 0 1 ?	5-46
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System	Echo	ECHO		OFF ON 0 1 ?	5-66
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Peak Search	Multi Peak Trace	MMPKT	:CALCulate:MARKer:PEAK:MULTI:TRACE	<integer> ?	5-53
Mode	Mode	MODE	:INSTrument[:SELeCt]	SA EMC ?	5-44
Peak Search	Peak Search	MPK[1-9]	:CALCulate:MARKer[1-9]:MAXimum	none	5-50
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Peak Search	Next Left Peak Search	MPKL[1-9]	:CALCulate:MARKer[1-9]:MAXimum:LEFT	none	5-50
Peak Search	Minimum Search	MPKM[1-9]	:CALCulate:MARKer[1-9]:MINimum	none	5-51
Peak Search	Next Peak Search	MPKN[1-9]	:CALCulate:MARKer[1-9]:MAXimum:NEXT	none	5-50
Peak Search	Peak to Peak Search	MPKP[1-9]	:CALCulate:MARKer[1-9]:PTPeak	none	5-52
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Peak Search	Next Right Peak Search	MPKR[1-9]	:CALCulate:MARKer[1-9]:MAXimum:RIGHT	none	5-51
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Marker	Marker State	MS[1-9]	:CALCulate:MARKer[1-9]:STATe	OFF ON 0 1 ?	5-34
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Marker	Marker Table	MTB	:CALCulate:MARKer:TABLE:STATe	OFF ON 0 1 ?	5-38
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Meas - Control	Scan	SCAN	:MEASure:SCAN	RUN HOLD STOP ?	5-41
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Sweep	Single	SI	:INITiate[:IMMediate]	none	5-65
Meas - Control	Scan Info	SINFO		OFF ON 0 1 ?	5-42
Span	Span	SP	[[:SENSe]:FREQUency:SPAN	<frequency> ?	5-60
Frequency	CF Step	SS	[[:SENSe]:FREQUency:CENTer:STEP[:INCRement]	<frequency> ?	5-28
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Common	*IDN	*IDN	*IDN	?	5-76
Common	*OPC	*OPC	*OPC	?	5-76
Common	*RST	*RST	*RST	none	5-77
Common	*SRE	*SRE	*SRE	<integer> ?	5-77
Common	*STB	*STB	*STB	?	5-77
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Peak Search	Multi Peak	MMPK	:CALCulate:MARKer:PEAK:MULTI	none	5-53
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Peak Search	Next Right Peak Search	MPKR[1-9]	:CALCulate:MARKer[1-9]:MAXimum:RIGHT	none	5-51
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Printer	Hard Copy	HCOPY	:HCOPY[:IMMEDIATE]	none	5-58
Sweep	Continuous	CO	:INITiate:CONTInuous	OFF ON 0 1 ?	5-65
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Bandwidth	Resolution Banship	RB	[:SENSe]:BANDwidth BWIDTH[:RESolution]	<frequency> ?	5-12
Amplitude	Delete All Corrections	COAD	[:SENSe]:CORRection:CSET:ALL:DELeTe	none	5-11
Amplitude	Apply Corrections	COAS	[:SENSe]:CORRection:CSET:ALL[:STATe]	OFF ON 0 1 ?	5-9
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Frequency	CF Step Auto	SSA	[:SENSe]:FREQuency:CENTer:STEP:AUTO	OFF ON 0 1 ?	5-29
Frequency	CF Step	SS	[:SENSe]:FREQuency:CENTer:STEP[:INCRement]	<frequency> ?	5-28
Span	Span	SP	[:SENSe]:FREQuency:SPAN	<frequency> ?	5-60
Span	Full Span	FS	[:SENSe]:FREQuency:SPAN:FULL	none	5-61
Span	Last Span	LS	[:SENSe]:FREQuency:SPAN:PREVious	none	5-61
Span	Zoom In	ZI	[:SENSe]:FREQuency:SPAN:ZIN	none	5-61
Span	Zoom Out	ZO	[:SENSe]:FREQuency:SPAN:ZOUT	none	5-62
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Amplitude	Attenuation	AT	[:SENSe]:POWer[:RF]:ATTenuation	<amplitude> ?	5-4
Amplitude	Attenuation Auto	ATA	[:SENSe]:POWer[:RF]:ATTenuation:AUTO	OFF ON 0 1 ?	5-5
Amplitude	Internal Amplifier	IA	[:SENSe]:POWer[:RF]:GAIN[:STATe]	OFF ON 0 1 ?	5-7
Sweep	Sweep Time	ST	[:SENSe]:SWEp:TIME	<time> ?	5-63
Sweep	Sweep Time Auto	STA	[:SENSe]:SWEp:TIME:AUTO	OFF ON 0 1 ?	5-64

---

## APPENDIX B - ERROR CODE

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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---

## APPENDIX C - Example

### < EMC Limit : \*.emt >

<<< EMC Limit Data for LSA Series Signal Analyzer >>>

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- Explanation :

Frequency            Level

MHz                  dBuV

\*\*\* Peak Limit Line \*\*\*

\*\*\* Average Limit Line \*\*\*

0.150000            59.00

0.500000            46.00

5.000000            46.00

5.000000            50.00

30.000000           50.00

\*\*\* Quasi-Peak Limit Line \*\*\*

0.150000            66.00

0.500000            56.00

5.000000            56.00

5.000000            60.00

30.000000           60.00

### < EMC Antenna : \*.ant >

<<< Antenna Correction Data for LSA Series Signal Analyzer >>>

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Frequency            Level

MHz                  dBuV/m

0.010000            2.20

2.000000            2.30

3.000000            2.30

4.000000            2.20

5.000000            2.20

---

8.000000	2.20
10.000000	2.40
15.000000	2.40
20.000000	2.40
30.000000	2.40

**< EMC Cable : \*.cbl >**

<<< Cable Correction Data for LSA Series Signal Analyzer >>>

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Frequency	Level
MHz	dB
0.010000	6.20
2.000000	6.30
3.000000	6.30
4.000000	6.20
5.000000	6.20
8.000000	6.20
10.000000	6.40
15.000000	6.40
20.000000	6.40
30.000000	6.40



Contact us : LIG Nex1 Co., Ltd.  
Prudential Tower 11F ~ 12F, 838  
Yoksam-dong, Kangnam-gu, Seoul, Korea  
Phone : 82-2-2033-0495, 0491  
Fax : 82-2-2005-0602  
Email :  
URL : [www.lignex1.com/tm](http://www.lignex1.com/tm)

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