

# V i e w

# 9 0 0

## U S E R   M A N U A L



Revision 1.0

## Table of Contents

SAFETY INSTRUCTIONS .....	4
Strorage.....	5
Warning.....	5
CERTIFICATION .....	6
1. General Information .....	7
1.1. DESCRIPTION .....	8
1.1.1. Key Measurements .....	8
1.1.2. Key Measurements .....	8
1.2. THE LAYOUT OF View900 .....	9
2. Instrument Overview.....	10
2.1. Front Panel .....	11
2.1.1. Power Key.....	12
2.1.2. Mode Key .....	12
2.1.3. ESC Key .....	12
2.1.4. Multi-function Button .....	12
2.1.5. Navigation Button .....	13
2.1.6. Rotary Knob.....	13
2.1.7. Indicator .....	13
2.1.8. Display.....	14
2.1.9. DC Power Connector .....	14
2.1.10. RF Out Port .....	14
2.1.11. Ethernet Port ->.....	14
2.1.12. USB Port.....	14
2.2. Power Adaptor .....	14
2.3. Battery .....	14
2.3.1. Installing a battery.....	15

2.3.2. Charging a Battery.....	15
2.3.3. LOW Bttery.....	16
2.3.4. Automatic Power Off when Battery Low .....	16
2.3.5. Caution .....	16
3. Menu Descriptions .....	18
3.1. Menu Descriptions .....	19
3.1.1. Cable and Antenna Analyzer mode.....	20
3.1.2. Calibration.....	22
3.1.3. Setting .....	23
3.1.4. Power Sensor .....	26
3.1.5. Files .....	27
3.1.6. Information .....	29
4. CSS Measure Descriptions .....	30
4.1. Tap Menu.....	31
4.1.1. Measure .....	31
4.1.2. FREQ .....	32
4.1.3. AMP .....	33
4.1.4. Sweep.....	34
4.1.5. Marker.....	34
4.2. Multi-Function Button.....	35
4.2.1. Cal-Numeric '1' .....	35
4.2.2. Freq/dist-Numeric '2' .....	40
4.2.3. Autoscale-Numeric '3' .....	42
4.2.4. Peak-Numeric '4' .....	43
4.2.5. Trace-Numeric '5' .....	43
4.2.6. Run/Hold-Numeric '6' .....	45
4.2.7. Save-Numeric '7' .....	45
4.2.8. Load-Numeric '8' .....	46
4.2.9. Limit-Numeric '9'.....	47
4.2.10. Preset-Numeric '•' .....	48

4.2.11.	48
Meas-Numeric '0'	48
4.2.12.    System-Numeric '+/-'	48
5.    Tap Menu & Multi Function Button Descriptions	52
5.1.    VSWR-VSWR Measurement	53
5.2.    VSWR-Return Loss Measurement	53
5.3.    DTF-VSWR Measurement	54
5.4.    DTF Return-Loss Measurement	55
5.5.    Cable-Loss Measurement	56
5.6.    Smith Chart Measurement	57
5.7.    Single/Dual Display	58
5.8.    RF Power Measurement	58
5.9.    Specifications	60
5.9.1.    Basic Specifications	60
5.9.2.    V90 Basic Specifications (Option)	61
5.9.3.    V95 Basic Specifications (Option)	61
5.10.    Ordering Information	62
5.10.1.    Supplied Accessories	62
5.10.2.    Optional Accessories	63
6.    warranty Information	64
7.    Appendix	67

## SAFETY INSTRUCTIONS

The Analyzer must be used only by skilled and specialized staff or thoroughly trained personnel with the required skills and knowledge of safety precautions.

Carefully read through the following safety instructions before putting the Analyzer into operation. Observe all the precautions and warnings provided in this Manual for all the phases of operation, service, and repair of the Analyzer.

View900 complies with INSTALLATION CATEGORY II as well as POLLUTION DEGREE 2 in IEC61010-1.

View900 is MEASUREMENT CATEGORY I (CAT I). Do not use for CAT II, III, or IV.

View900 is tested in stand-alone conditions or in combination with the accessories supplied by INNO INSTRUMENTS CO., LTD. against the requirement of the standards described in the Declaration of Conformity. If it is used as a system component, compliance of related regulations and safety requirements are to be confirmed by the system builder.

Never operate the Analyzer in an environment containing inflammable gasses or fumes.

Operators must not remove the cover or part of the housing. The Analyzer must not be repaired by the operator. Component replacement or internal adjustment must be performed only by qualified maintenance personnel.

Never operate the Analyzer if the power cable is damaged.

Never connect the test terminals to mains.

Never operate the Analyzer in the environment containing inflammable gasses or fumes.

Operators must not remove the cover or part of the housing. The Analyzer must not be repaired by the operator. Component replacement or internal adjustment must be performed by qualified maintenance personnel only.

Electrostatic discharge can damage the Analyzer when connected or disconnected from the DUT. Static charge can build up on your body and damage the sensitive circuits of internal components of both the Analyzer and the DUT. To avoid damage from electric discharge, observe the following:

- Always use a desktop anti-static mat under the DUT.
- Always wear a grounding wrist strap connected to the desktop anti-static mat via daisy-chained 1 MΩ resistor.
- Before operating, connect  clamp on the body of the Analyzer to the body of the DUT.

Observe all general safety precautions related to the equipment operation powered by mains.

The protection provided by the equipment may be impaired if the equipment is used in a manner not specified by the manufacturer. The definitions of safety symbols used on the instrument or in the Manual are listed below.

### Storage

Before first use, store your equipment in the factory package from 0 to +50°C and relative humidity up to 95% (at 25°C).

After removing the factory package, store the equipment from +10 to +35°C and relative humidity up to 80% (at 25°C).

Ensure that storage facilities are kept free from dust, fumes of acids and alkalis, aggressive gases, and other chemicals, which can cause corrosion.

### Warning

	Refer to the user's manual if the instrument is marked with this symbol
	<b>Direct Current</b>
	<b>Alternating Current</b>
	<b>Power On</b>
	<b>Power Off</b>
	<b>A chassis terminal: a connection to the instrument's chassis, which includes all exposed metal structure</b>

## CERTIFICATION

### EU Declaration of Conformity

EMC DIRECTIVE 2014/30/EU and LVD DIRECTIVE 2014/35/EU

for

PRODUCT: Cable Antenna Analyzer

"MODEL: View900"

**INNO Instrument Inc.**

E-22F, 30, Songdomirae-ro, Yeonsu-gu, Incheon 21990, Republic of Korea

December 19, 2017

#### SUMMARY

The equipment complies with standards;

EN 55011:2009/A1:2010	Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement
EN 61326-1:2013	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
EN 61326-2-1:2013	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-1: Particular requirements - Test configurations, operational conditions and performance criteria for sensitive test and measurement equipment for EMC unprotected applications
EN 61326-2-2:2013	Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-2: Particular requirements - Test configurations, operational conditions and performance criteria for portable test, measuring and monitoring equipment used in low-voltage distribution systems
EN 61000-3-2:2014	Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current <= 16 A per phase)
EN 61000-3-3:2013	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage systems, for equipment with rated current <= 16 A per phase and not subject to conditional connection
EN 61010-1:2010+A1:2017	Safety requirement for electrical equipment for measurement, control, and laboratory use

Following the provisions of Directive(s);

Directive 2014/30/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility (recast). Applicable from 20 April 2016.

Directive 2014/35/EU of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the member states relating to the making available on the market of electrical equipment designed for use within certain voltage limits

"This declaration was issued only under responsibility of the manufacturer"

Test Report No: RAPA17-O-040, RAPA17-O-043

(signature)

Mr. Hoon, Kim / President

## 1. GENERAL INFORMATION

---



## 1.1. DESCRIPTION

The wireless market continues to evolve. Service providers need to upgrade existing legacy networks. Cable antenna analyzer serves to installation and maintenance of cell sites. View900, INNO Cable Antenna Analyzer checks for defects and losses in various types of cell sites transmission line.

A reliable and cost effective cable antenna analyzer is required to manage cell sites more safely and efficiently.

View900 is the most reliable and accurate cable antenna analyzer including the functions of VSWR, Return Loss, DTF, Cable Loss, Smith Chart, Power Sensor.

View900 covers a wide range of frequencies from 5 MHz to 6 GHz and sets up trace data point up to 2049. It features user friendly graphic interface, GUI, 7-inch wide and bright LCD monitor for user-centered convenience that is available in any environment. It weighs 2.1 kg and light, portable measurement instrument. The 5.5 hour battery capacity and field replaceable lithium ion battery ensures enough and continuous working

### 1.1.1. KEY MEASUREMENTS

- High resolution VSWR Measurements
- Distance-to-Fault (DTF) Measurements
- Return Loss Measurements
- Cable Loss Measurements
- RF Power Measurements (Requires External Power Sensors)
- 

### 1.1.2. KEY FEATURES

- 5 MHz~6 GHz frequency range
- 7-inch TFT color display
- Dual display
- Quick Access button to all required measurements
- Up to 2049 data points to locate long-range problems
- Built-in cable menus contains >90 cables' characteristics
- User friendly GUI
- Save user setups, traces, screens into internal memory
- USB Port (USB 2.0)
- Very light weight
- Fast one-touch selection of menu item or positioning marker
- Smart Battery management can be used to check Battery capability
- Field replaceable Lithium Ion battery with over 5.5 hours operation time
- Backlight keypad for easier use in low light environments

## 1.2. THE LAYOUT OF View900



Front View



Rear View



Top View

## 2. INSTRUMENT OVERVIEW

---



## 2.1. Front Panel

The front view of View900 is represented in Figure 1.1. The front panel is equipped with the following parts:



Key button	
<ul style="list-style-type: none"> <li>- Rotary knob</li> <li>- Navigation Button</li> <li>- ESC Button</li> </ul>	<ul style="list-style-type: none"> <li>- Multi Function Button</li> <li>- Power Button</li> <li>- Menu Button</li> </ul>

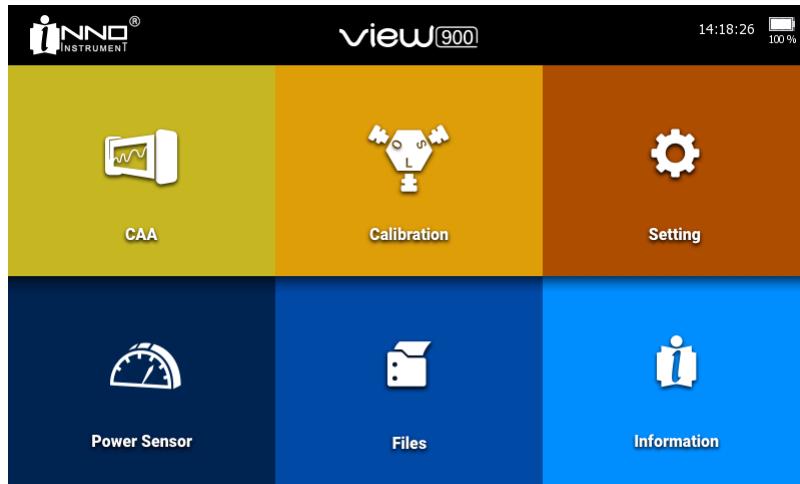
LED Indicator	
<ul style="list-style-type: none"> <li>- Green LED</li> <li>- Red LED</li> </ul>	<ul style="list-style-type: none"> <li>- Operating Status</li> <li>- Instrument is Charging</li> </ul>

### 2.1.1. POWER KEY

<b>Function</b>	Use to turn a device “On” or “Off”
<b>Operation</b>	To turn on the instrument, press a power button for 2-3 seconds. Press the button again for 2-3 seconds to turn “Off.”

### 2.1.2. MODE KEY

<b>Function</b>	Display modes
-----------------	---------------



### 2.1.3. ESC KEY

<b>Function</b>	Use to cancel previous inputs or close pop-up window
-----------------	--

### 2.1.4. MULTI-FUNCTION BUTTON

Multi-Key has two functions to input numbers and to operate specific function allocated to each number.

<b>Function</b>	A function to input numbers Operation of each unique function
-----------------	--

Unique functions allocated to each key are as follows:

Number	Multi Key (Silk)	Description
1	Cal	Calibration Menu
2	Freq/dist	Frequency / Distance setting
3	Autoscale	Change the Amplitude to fit to the measurement
4	Peak	Find a peak value
5	Trace	Trace Menu
6	Run/Hold	Run or Hold sweep (toggle)
7	Save	Save Menu
8	Load	Load Menu
9	Limit	Limit Menu

<b>0</b>	Meas	Measure Menu
.	Preset	Preset Menu
<b>+/-</b>	System	System Menu.

### 2.1.5. NAVIGATION BUTTON

The Navigation button is used to move the marker or change the value through an input window. Enter key is used to set the value.

<b>Function</b>	Move the marker Adjust the value of an input window Select a list item
-----------------	--

[Operation in an input window]

<b>▲</b>	Change the set value to higher than the current value.
<b>▼</b>	Change the set value to lower than the current value.
<b>◀</b>	Change the set value to lower than the current value.
<b>▶</b>	Change the set value to higher than the current value.
<b>Enter</b>	Set the value in the current input window.

[Operation of Marker]

<b>▲</b>	No operation
<b>▼</b>	No operation
<b>◀</b>	Move the marker to the left by (Data Point)/10 from the set place.
<b>▶</b>	Move the marker to the right by (Data Point)/10 from the set place.
<b>Enter</b>	No operation

### 2.1.6. ROTARY KNOB

The Rotary Knob provides easy navigation to change menu, value and move the marker.

<b>Function</b>	Move the set marker Adjust the value of an input window Select a list item
-----------------	--

### 2.1.7. INDICATOR

Green and Red LEDs are on the left of the front power key. The information displayed by each LED is as follows:

Color	Status	Indication
Green	On	Power On, Booting
	Off	Power Off
Red	On	Battery Charging
	Off	-

### 2.1.8. DISPLAY

View900 has 7-inch-wide color LCD with a full-touch capability for easier access to all required measurement settings.

**Note**

---

*Avoid to touch screen with sharp object such as a pen or screwdriver. Touchscreen can be damaged.*

### 2.1.9. DC POWER CONNECTOR

Function	Supply DC power to an instrument
Note	If AC/DC jacks are connected to a connector, shaking a jack may damage the connector.

### 2.1.10. RF OUT PORT

Function	RF Output port, 5 MHz~6 GHz, 50ohm Type-N Female
Note	Max Input Power +25dBm

### 2.1.11. ETHERNET PORT ->

Function	Debug port.
----------	-------------

### 2.1.12. USB PORT

Function	Save or copy files to an external USB thumb drive. Connect an electrical calibration kit and a power sensor or optional products.
----------	--

## 2.2. Power Adaptor

View900 uses the following power unit:

<b>Product</b>	Power Unit
<b>Model No.</b>	INNO-PU-8
<b>AC Input</b>	100-240 Va.c. 50-60Hz
<b>DC Output</b>	12.0Vd.c. 3.0A Max
<b>Manufacturer</b>	INNO INSTRUMENT (CHINA) INC.

## 2.3. Battery

View900 uses the following Battery Pack:

<b>Product</b>	BATTERY PACK
<b>Model No.</b>	LBT-230A
<b>Power Supply</b>	7.4Vd.c. 7800MAh, 57.72Wh
<b>Manufacturer</b>	INNO INSTRUMENT (CHINA) INC.

**Note**

---

*RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.*

*DISPOSE OF USED BATTERIES ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.*

- ① When the “TEST” button on the battery is pressed, the remaining battery volume will appear in the battery icon next to the “TEST” button.
- ② Each level of the battery indicates 20% of the battery charging status. (e.g. level 3 indicates upto 60% charge).
- ③ Insert the battery pack with the following instruction.

### **2.3.1. INSTALLING A BATTERY**

Caution: Fully charge the battery before first using the instrument.



1. Slide down and pull battery cap to Open
2. Insert the battery pack
3. Close the battery cap

### **2.3.2. CHARGING A BATTERY**

1. Insert a battery
2. Provide AC-DC Adaptor
3. Press power button to turn on
4. Check if a battery icon is displayed on the screen

### 2.3.3. LOW BATTERY

Charge the battery or provide AC/DC adaptor immediately when the following lowe-battery warning appears:



### 2.3.4. AUTOMATIC POWER OFF WHEN BATTERY LOW

When the battery power is lower than 5%, the power will be off with the following message:



### 2.3.5. CAUTION

- Do not store the battery pack in the high humidity and heat.
- If electrolyte from the battery pack is leaking or the battery pack smells strangely, keep the battery pack away from fire.
- In case that electrolyte from the battery pack is touched by any part of the human body, wash it immediately and go to hospital to prevent potential damage.
- Use the authorized charger only.
- Do not abandon the battery pack in the car in the summer.
- Avoid any shock to the battery pack.
- Avoid placing the battery pack near heating sources or on the place near windows.
- If the battery is unused for a long time, separate it from the unit.
- Keep this battery pack away from children
  
- <French>
- Ne pas stocker la batterie dans un niveau élevé d'humidité et de chaleur.
- En cas de fuite d'électrolyte de la batterie ou si la batterie dégage une odeur étrange, éloignez la batterie du feu.
- Au cas où une partie quelconque du corps humain touche l'électrolyte de la batterie, lavez-la immédiatement et rendez-vous à l'hôpital pour éviter des dommages potentiels.

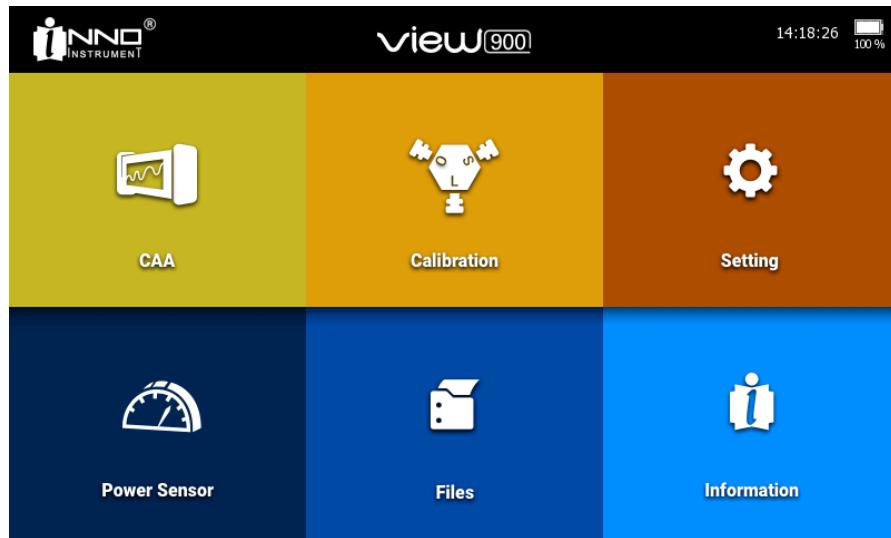
- Utilisez uniquement le chargeur autorisé.
- Ne pas abandonner la batterie dans une voiture en été.
- Évitez tout choc sur la batterie.
- Évitez de placer la batterie à proximité de sources de chaleur ou de fenêtres.
- Si la batterie est inutilisée pendant une longue période, séparez-la de l'unité.
- Gardez cette batterie hors de portée des enfants.

### 3. MENU DESCRIPTIONS

---

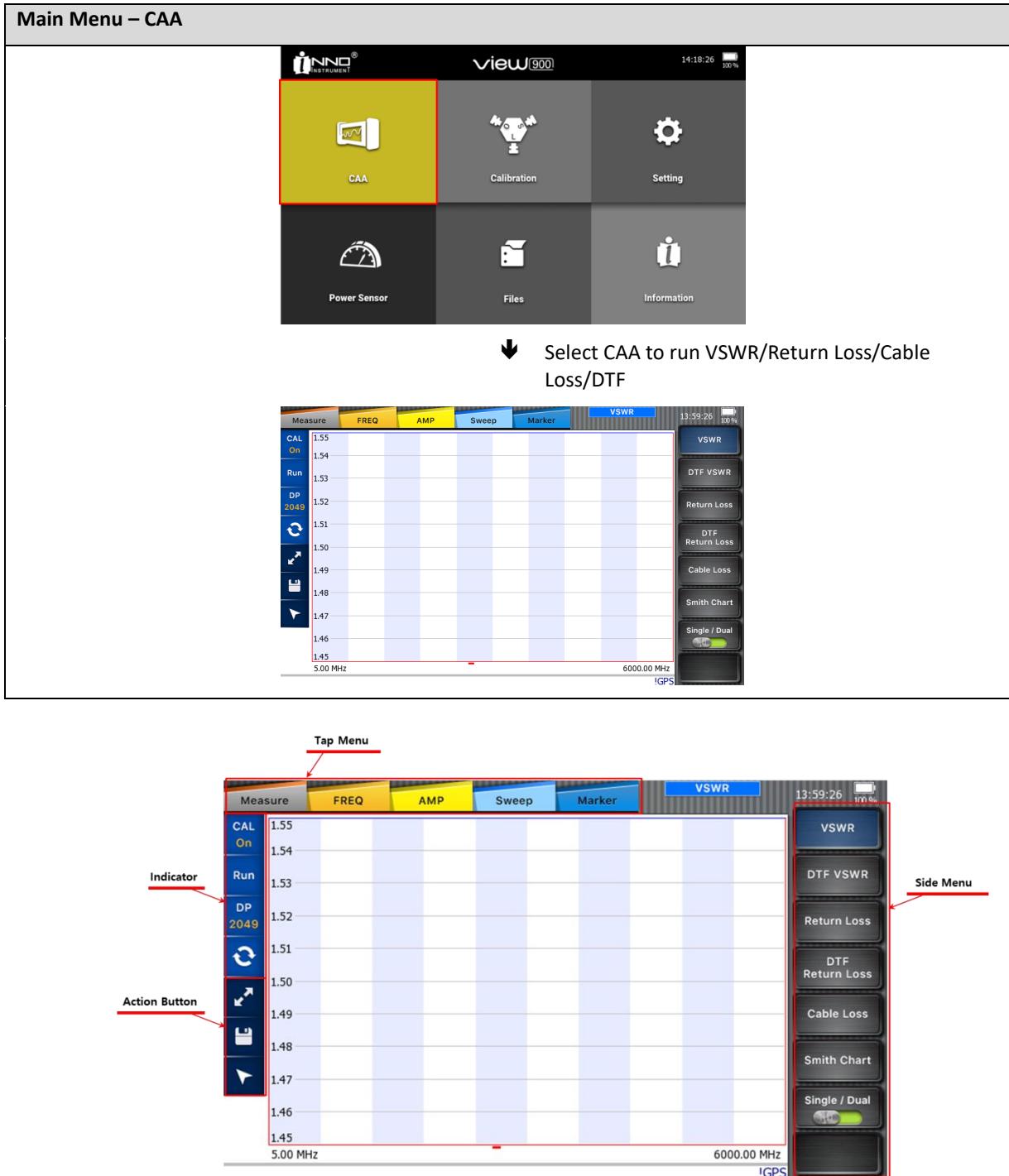


### 3.1. Menu Descriptions



	- Run a 'Cable & Antenna Analyzer mode'
	<ul style="list-style-type: none"> <li>- Run 'Calibration.'</li> <li>- Select either Mechanical (OSL) Calibration or Electrical Calibration.</li> </ul>
	- 'Settings' to configure measurement parameters
	- 'Power Measurement with an external power Sensor.'
	- 'Files' menu to view saved data
	- 'Information' of the instrument

### 3.1.1. CABLE AND ANTENNA ANALYZER MODE



### 3.1.1.1. TOP MENU & SIDE MENU

Menu	Selected	Description
Measure	Measure	- Change measurement modes
FREQ	FREQ	- Change frequency and distance settings
AMP	AMP	- Change amplitude settings
Sweep	Sweep	- Change Sweep settings
Marker	Marker	- Change and set Marker

### 3.1.1.2. INDICATOR

Displays Sweep and Calibration information

Indicator									
CAL On	↔	CAL Off							
Run	↔	Hold							
Run	↔	Run 1							
Hold	↔	Hold 1							
DP 129	↔	DP 257	↔	DP 513	↔	DP 1025	↔	DP 2049	- Data Point

### 3.1.1.3. ACTION BUTTON → QUICK ACCESS BUTTON

Provides quick access to a screen setup, a screen capture:

	Full Screen button		Normal Screen button
---	--------------------	---	----------------------

	Screen Capture		
	Marker Table On/Off		

Indicator	
 : No GPS Antenna Connected	: GPS Antenna connected, Locking to GPS

-  : GPS Locked (lat/log information display)

### 3.1.2. CALIBRATION

In order to minimize measurement uncertainty, Calibration must be conducted when you change the frequency. View900 supports Open-Short-Load Mechanical Calibrator and Electrical Calibrator to minimize calibration time.

View900 has two Calibration methods.

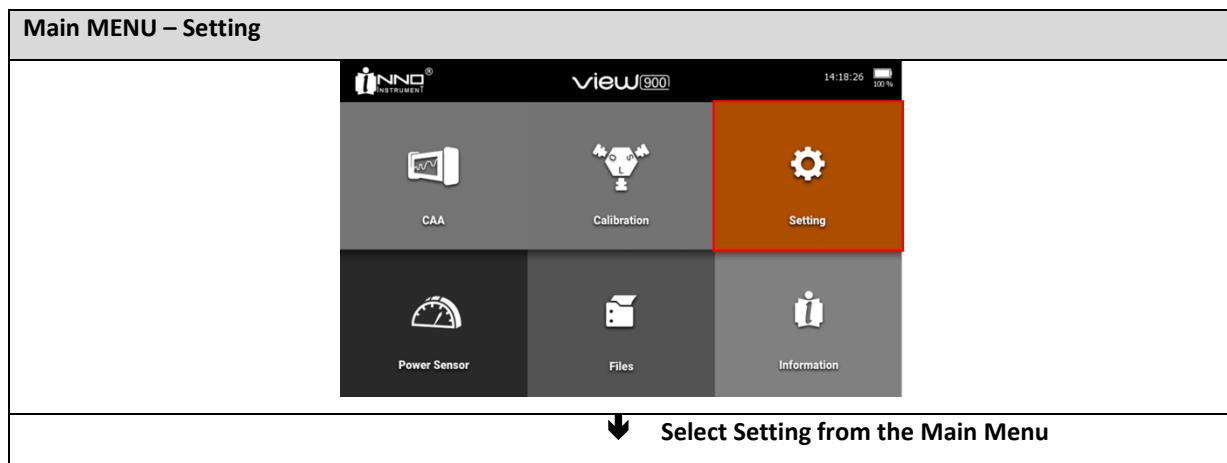
1. Select 'Calibration' in the Main Menu.
2. Select 'Cal' in the Measure Mode.

Main MENU – Calibration		
	 <b>view900</b>  CAA  Calibration  Setting  Power Sensor  Files  Information	14:18:26 100%
 Select Calibration from the Main Menu		



### 3.1.3. SETTING

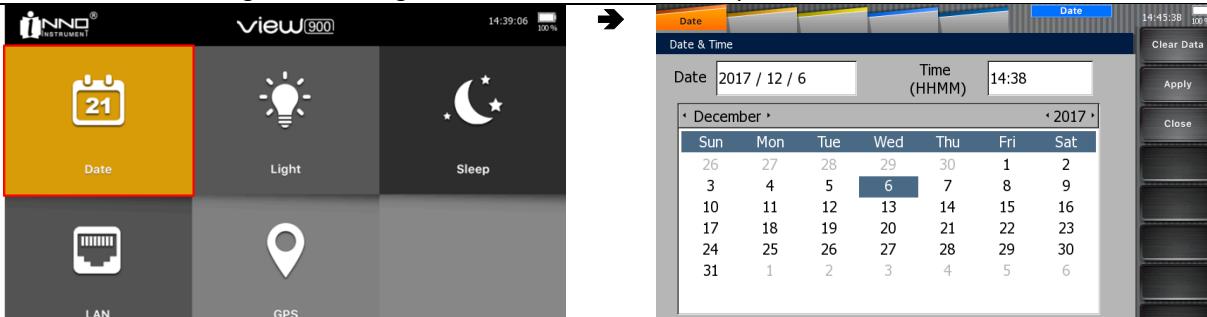
Select Setting in the Main Menu to configure instrument setting.





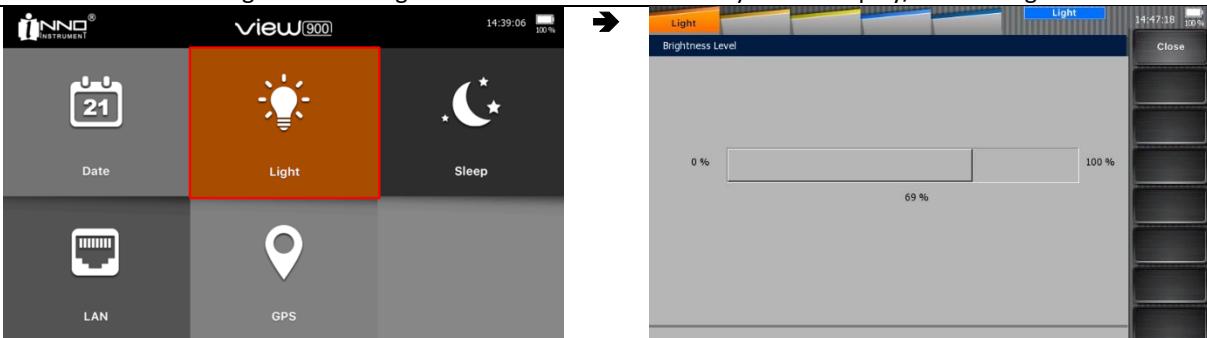
### Setting – Date

- Time Setting
- You can change Time setting from Multi-function button 'System > Date/Time.'



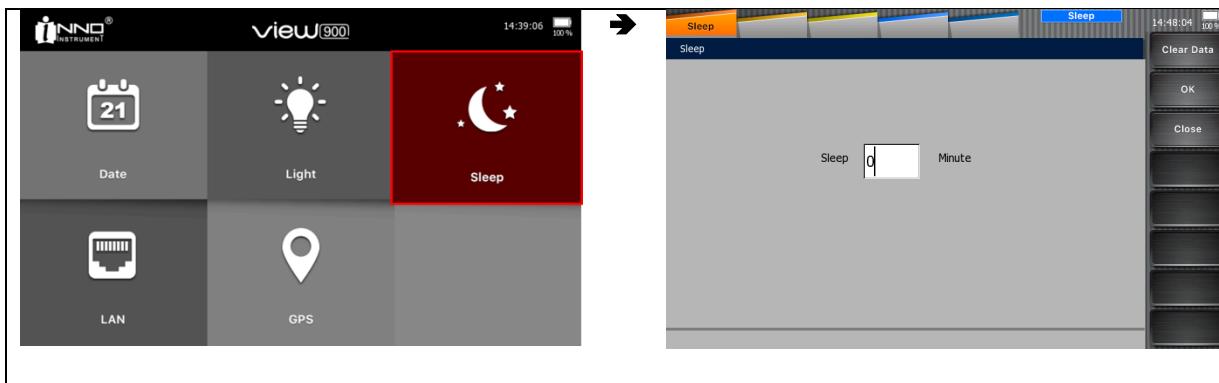
### Setting – Light

- Adjust LCD Brightness
- You can change Time setting from Multi-function button 'System > Display/Sound > Light.'



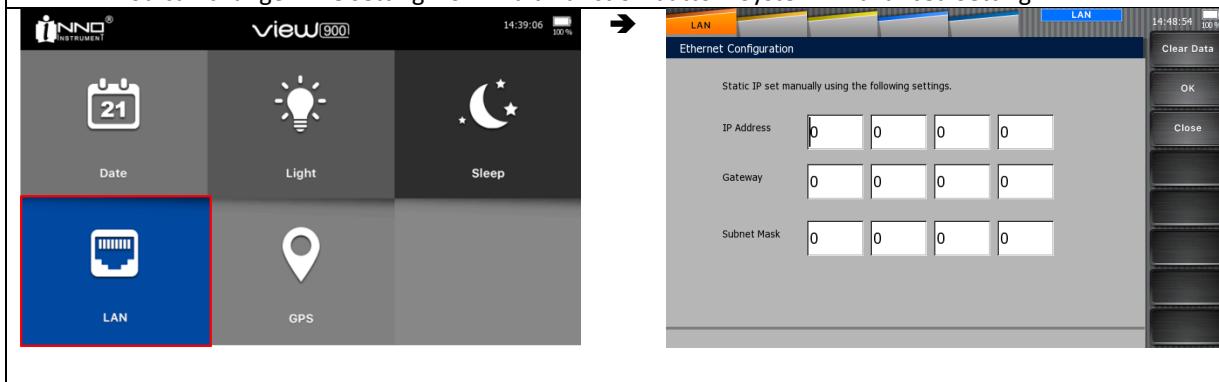
### Setting – Setup

- Sleep Mode Time
- You can change Time setting from Multi-function button 'System > Display/Sound > Sleep Mode.'



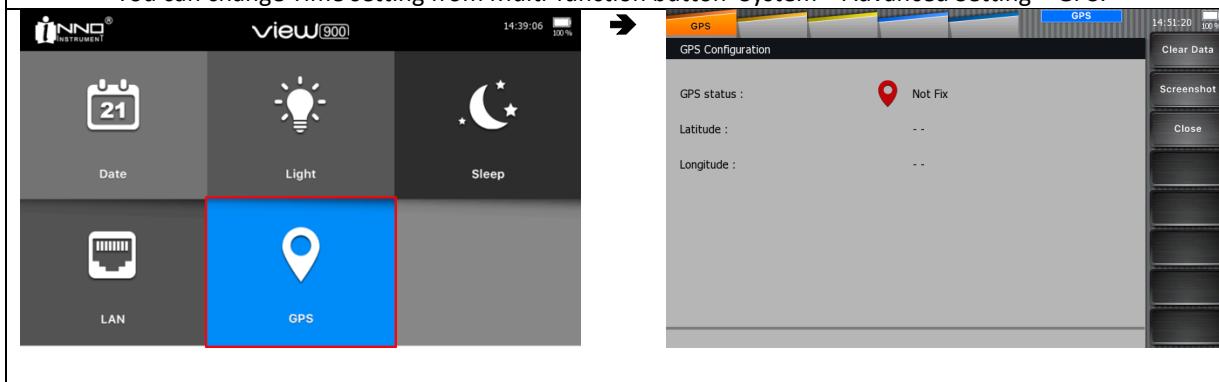
### Setting – LAN

- Ethernet Setting
- You can change Time setting from Multi-function button 'System > Advanced Setting > LAN.'



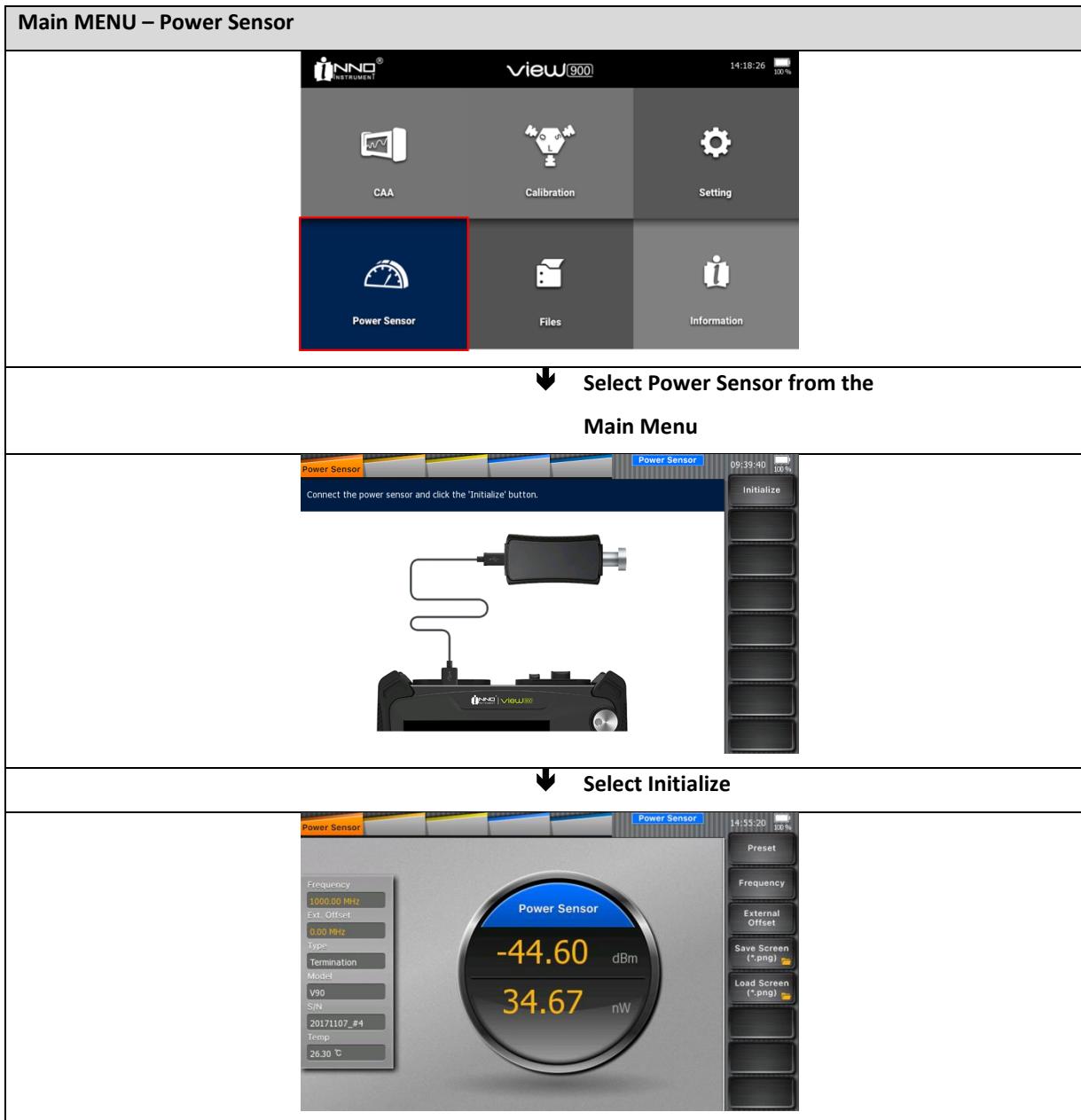
### Setting – GPS

- GPS information (when GPS antenna connected)
- You can change Time setting from Multi-function button 'System > Advanced Setting > GPS.'



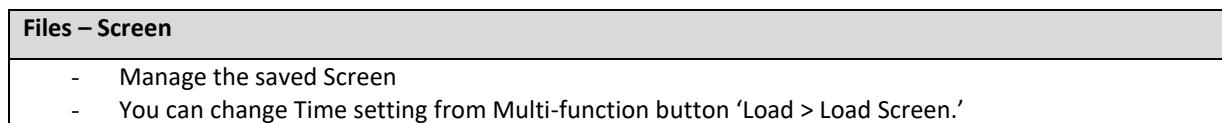
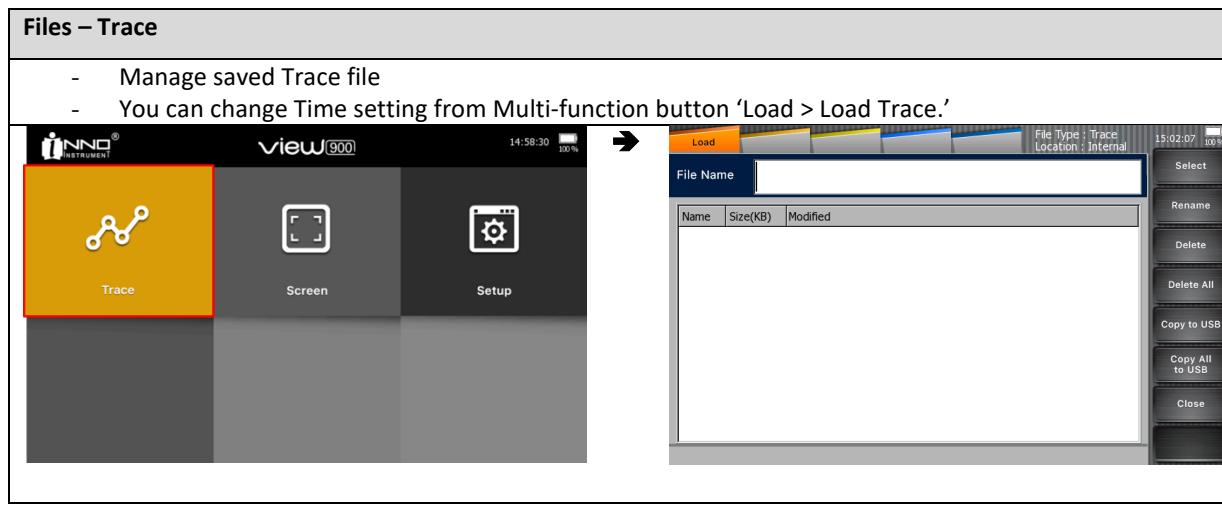
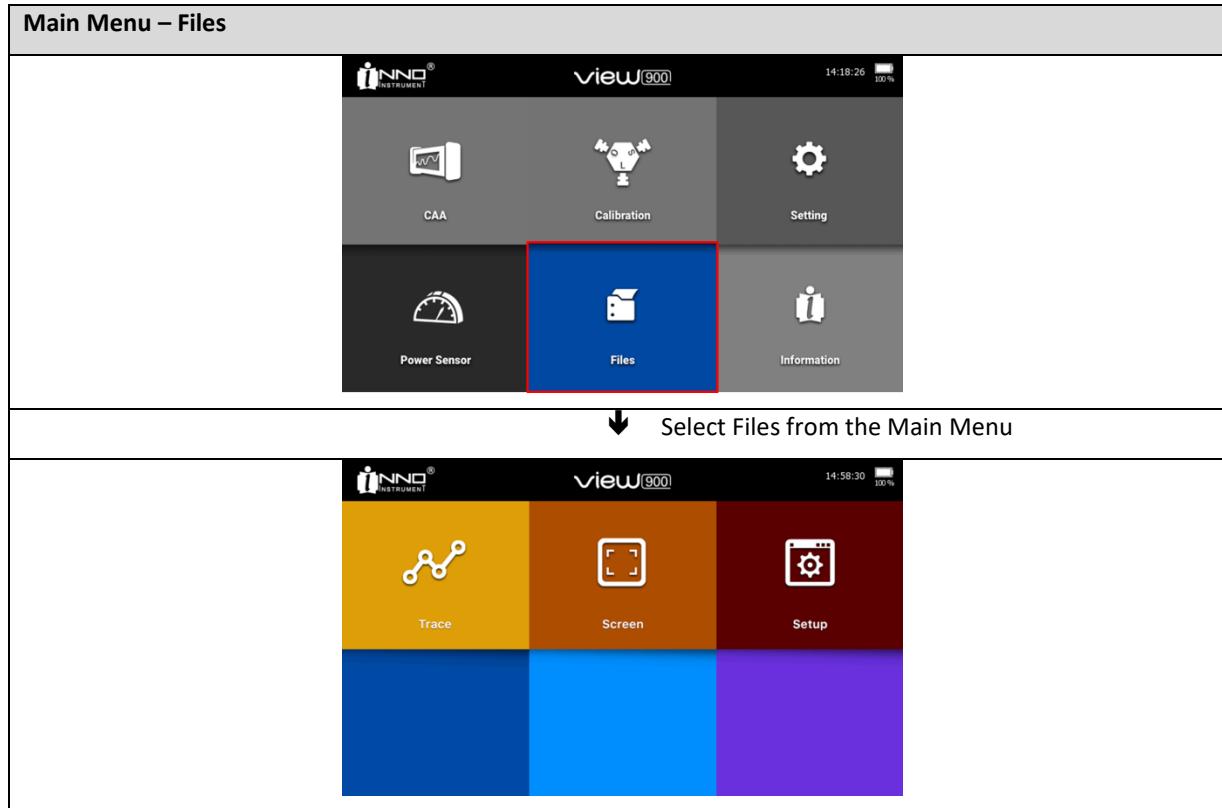
### 3.1.4. POWER SENSOR

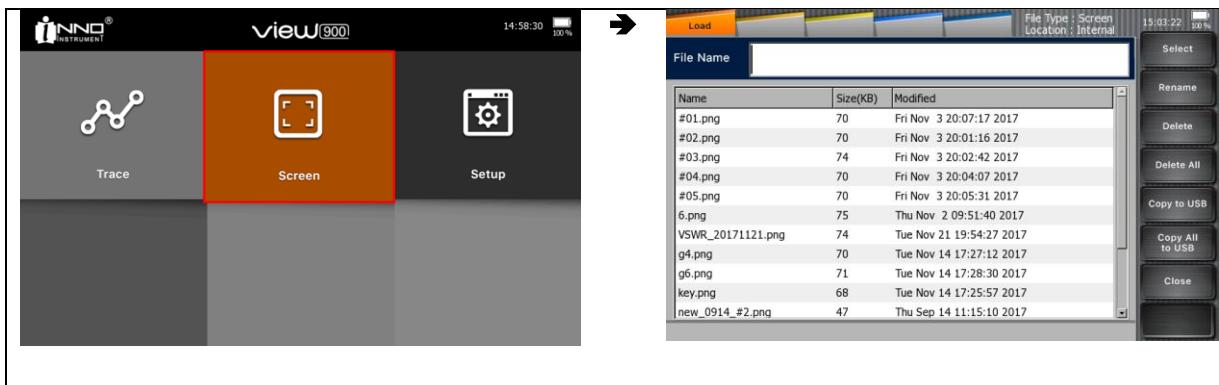
To perform RF power measurement, provide external power sensors. When you connect external power sensor to USB port, View900 automatically recognize. You can measure RF power after initialization.



### 3.1.5. FILES

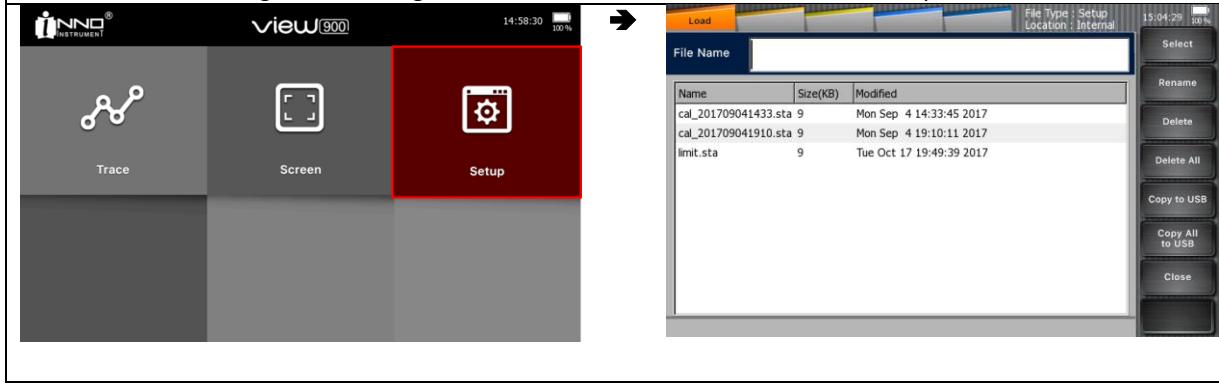
Use File menu to view saved data.





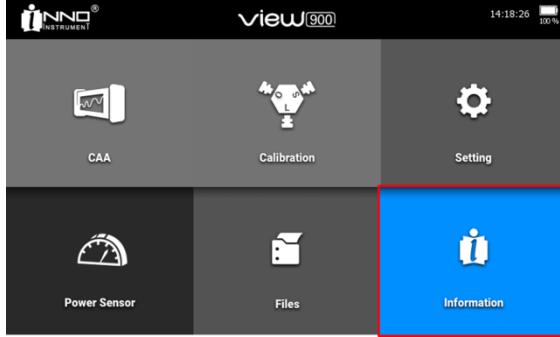
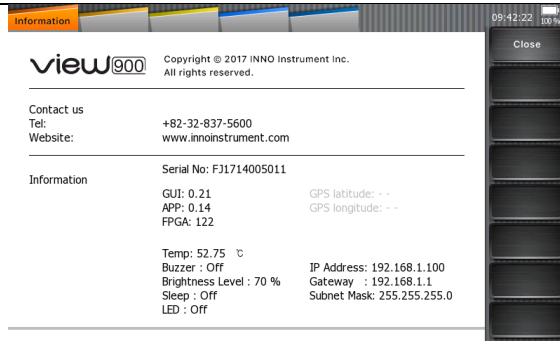
### Files – Setup

- Manage the saved Setup
- You can change Time setting from Multi-function button 'Load > Load Setup.'



### 3.1.6. INFORMATION

Check the instrument information such as IP, Software, Hardware version, and information related to after-sales service.

Main Menu – Information

<b>↓ Select Information from the Main Menu</b>


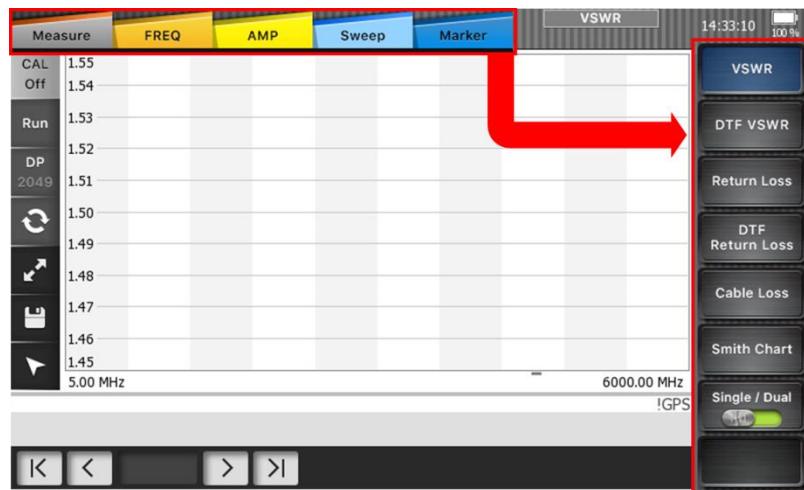
## 4. CSS MEASURE DESCRIPTIONS

---



#### 4.1. Tap Menu

Tap menus on top of the display screen provides menu to configure the instrument such as frequency, amplitude, Sweep, and marker. A Side Menu appears with each Tap menu selection. The figure below shows that a side menu is changed when Measure key selected.



##### 4.1.1. MEASURE

Measure button provides measurement mode such as VSWR, DTF VSWR, Return Loss, DTF Return Loss, Cable Loss, and Smith Chart.

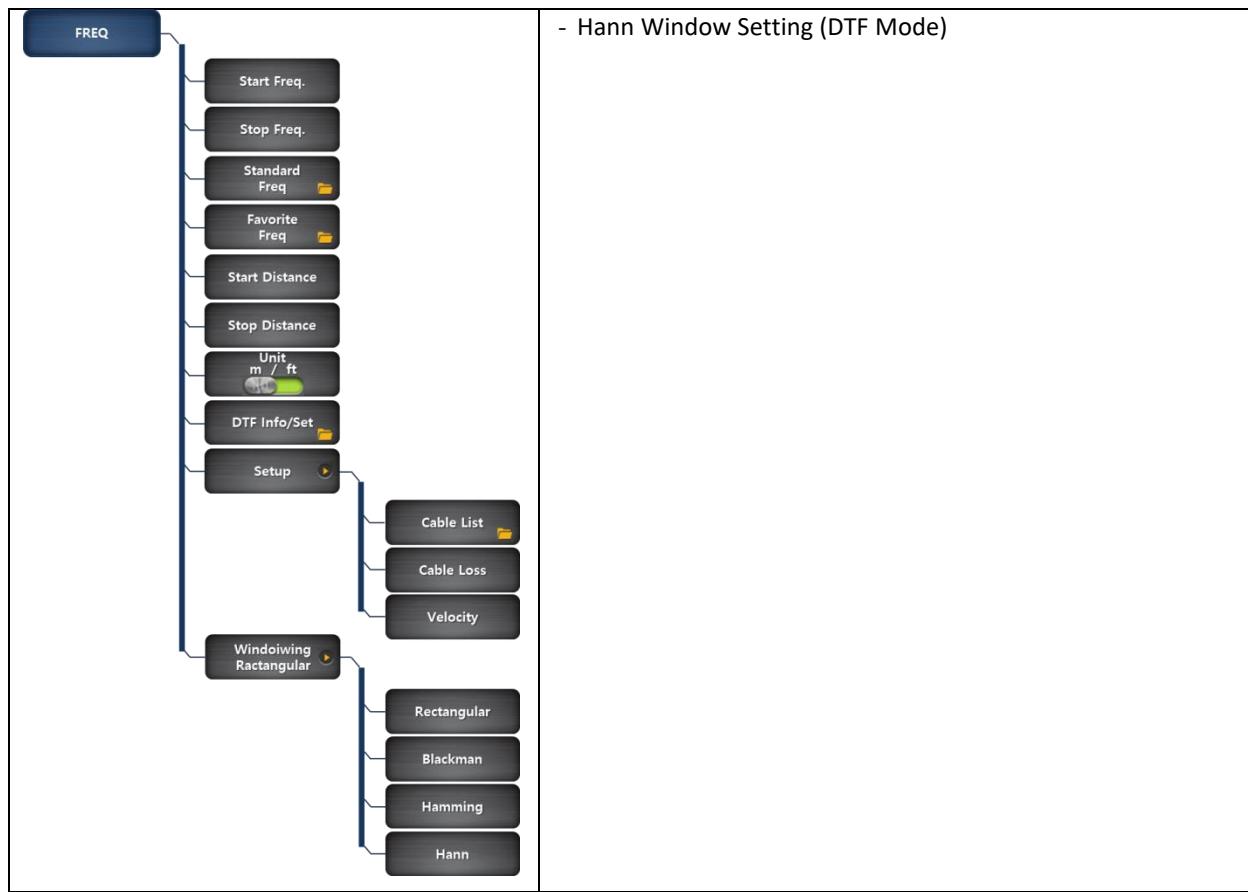
Measure Menu-Tree	
<div style="border: 1px solid #ccc; padding: 5px; display: inline-block;">Measure</div> <div style="margin-left: 10px;"> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">VSWR</div> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">DTF VSWR</div> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">Return Loss</div> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">DTF Return Loss</div> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">Cable Loss</div> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">Smith Chart</div> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">Single / Dual</div> </div>	<ul style="list-style-type: none"> <li>- Select VSWR to perform VSWR measurement</li> <li>- Select DTF VSWR to perform DTF measurement in VSWR Scale</li> <li>- Select Return Loss to perform Return Loss measurement</li> <li>- Select DTF Return Loss to perform DTF measurement in Return Loss scale</li> <li>- Select Cable Loss to perform Cable Loss measurement.</li> <li>- Select Smith Chart to perform Smith Chart measurement</li> <li>- Select Single/Dual display mode to perform two measurements simultaneously</li> </ul>

#### 4.1.2. FREQ

Change the frequency setting and the distance in DTF mode.

		VSWR	DTF VSWR	Return Loss	DTF Return Loss	Cable Loss	Smith Chart
FREQ	Start Freq.	o	o	o	o	o	o
	Stop Freq.	o	o	o	o	o	o
	Standard Freq.	o		o		o	o
	Favorite Freq.	o		o		o	o
	Start Distance		o		o		
	Stop Distance		o		o		
	Unit		o		o		
	DTF Info/Set		o		o		
	Setup		o		o		
	Windowing		o		o		

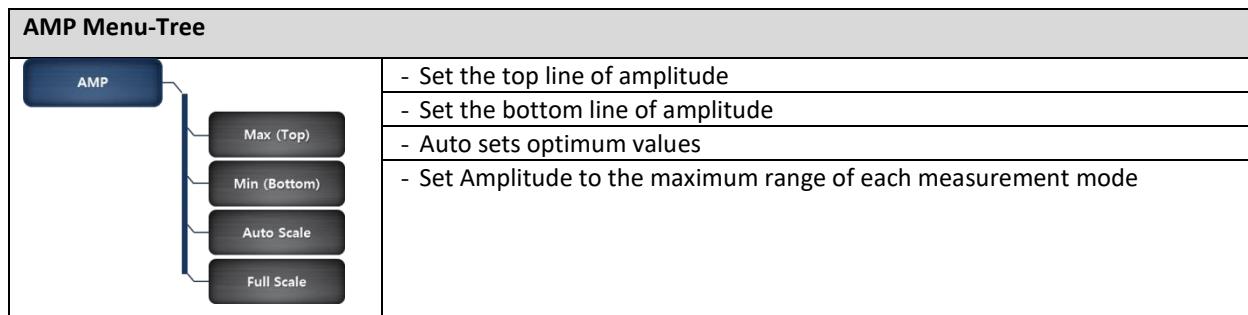
FREQ Menu-Tree	<ul style="list-style-type: none"> <li>- Start Frequency Setting (all Modes)</li> <li>- Stop Frequency Setting (all Modes)</li> <li>- Selects the standard frequency band</li> <li>- Adds 'Standard Freq' to Favorites</li> <li>- Start Distance Setting (DTF Mode)</li> <li>- Stop Distance Setting (DTF Mode)</li> <li>- Distance Unit Setting (DTF Mode)</li> <li>- DTF Setting Information (DTF Mode)</li> <li>- DTF Measurement Parameters Setting (DTF Mode)</li> <li>- Selects a cable from Cable List (DTF Mode)</li> <li>- Cable Loss Setting (DTF Mode)</li> <li>- Cable Velocity Setting (DTF Mode)</li> <li>- Window Filter Setting (DTF Mode)</li> <li>- Rectangular Window Setting (DTF Mode)</li> <li>- Blackman Window Setting (DTF Mode)</li> <li>- Hamming Window Setting (DTF Mode)</li> </ul>



To change the settings, click on the Side Menu button you want to change, and an input window will appear. Enter number keys and select a suitable unit.

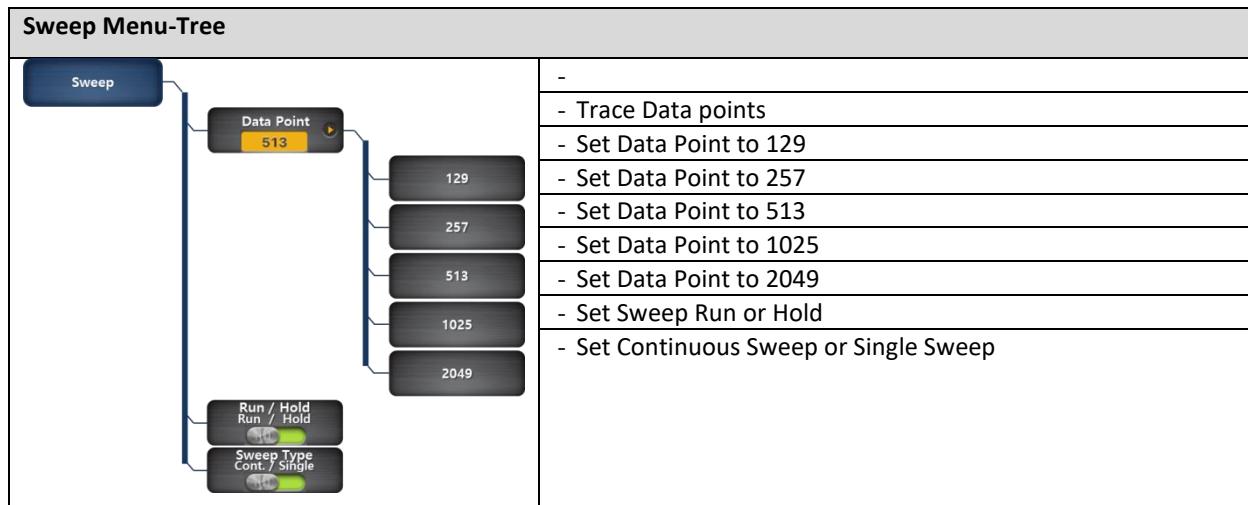
#### 4.1.3. AMP

AMP is used to adjust the amplitude setting to fit the measurement trace into a screen.



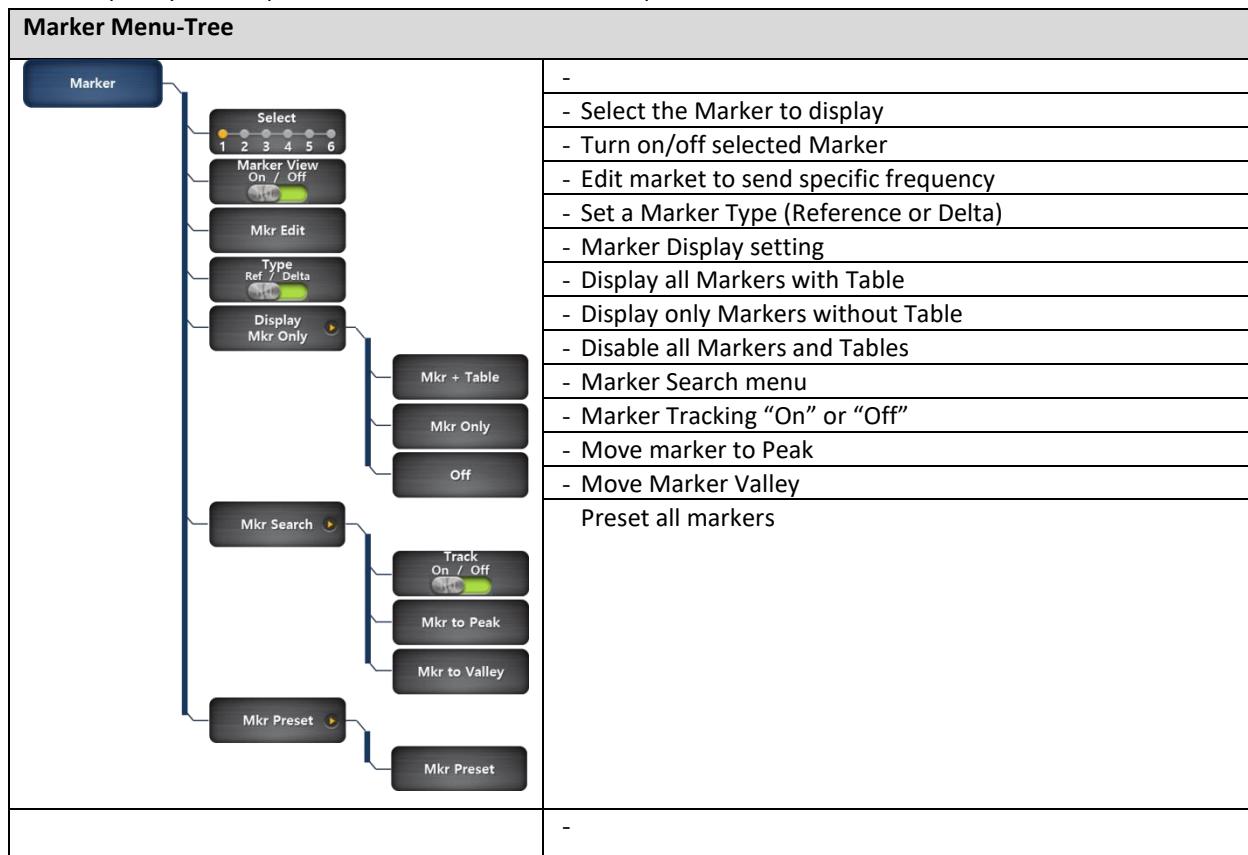
#### 4.1.4. SWEEP

Change Trace Data Points



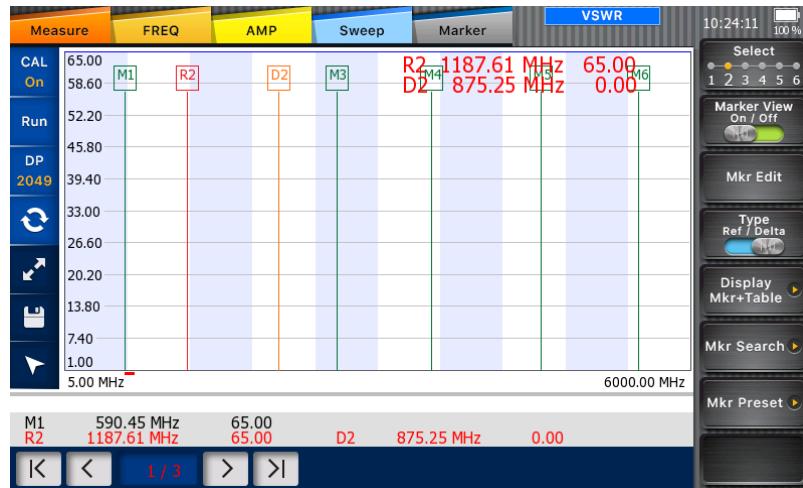
#### 4.1.5. MARKER

Marker can be set up to 6. After Selecting the number of Marker when turning “On”, then you can see frequency and amplitude information on the marker point.



Marker has two types:

- Reference displays amplitude and frequency (distance) on the marker position.
- Delta Marker displays the difference of frequency (distance) and amplitude from the Reference point.



## 4.2. Multi-Function Button

You can conveniently select specific setting or function using multi-function button on the View900,

### 4.2.1. CAL-NUMERIC '1'

Performing Calibration:

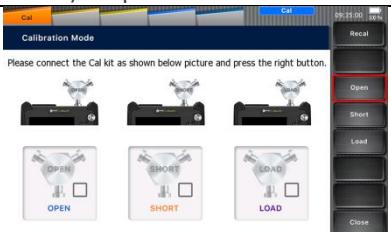
Calibration Procedure	
Multi-Key Function 'Cal' (Numeric '1') Press	
↓	



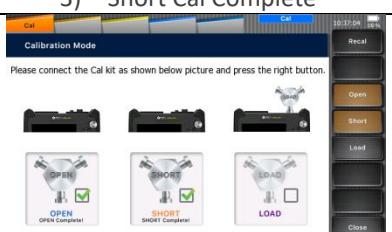
#### 4.2.1.1. OSL CALIBRATION

Perform Open-Short-Load calibration using O-S-L Mechanical calibrator.

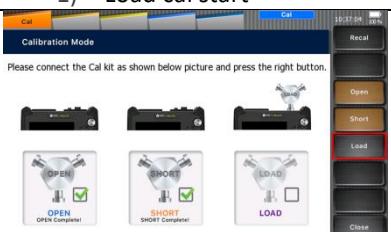
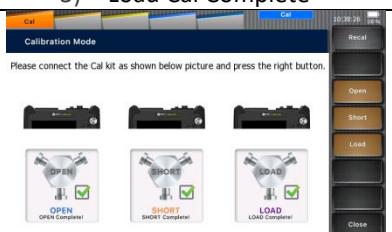
##### 1. Open Calibration

1) Open cal start	2) Open Cal Process	3) Open Cal Complete
		

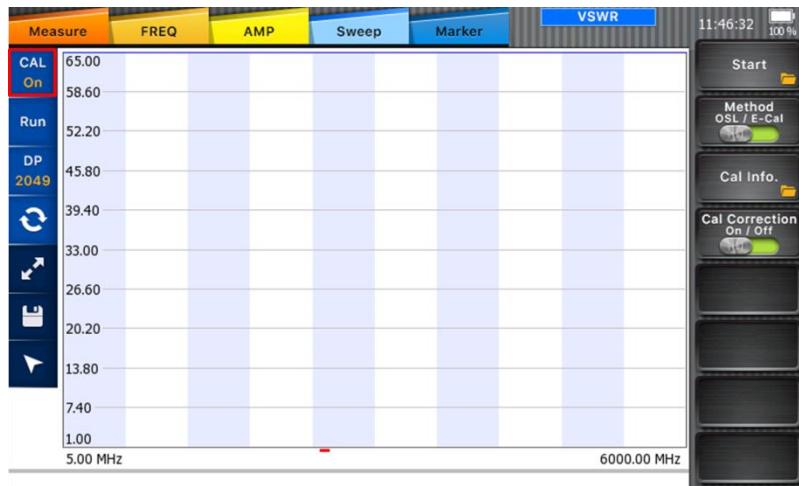
##### 2. Short Calibration

1) Short cal start	2) Short Cal Process	3) Short Cal Complete
		

##### 3. Load Calibration

1) Load cal start	2) Load Cal Process	3) Load Cal Complete
		

When calibration done successfully, the screen automatically returns to the measurement screen. CAL "On." Icon will be displayed.



#### 4.2.1.2. ELECTRICAL CALIBRATION

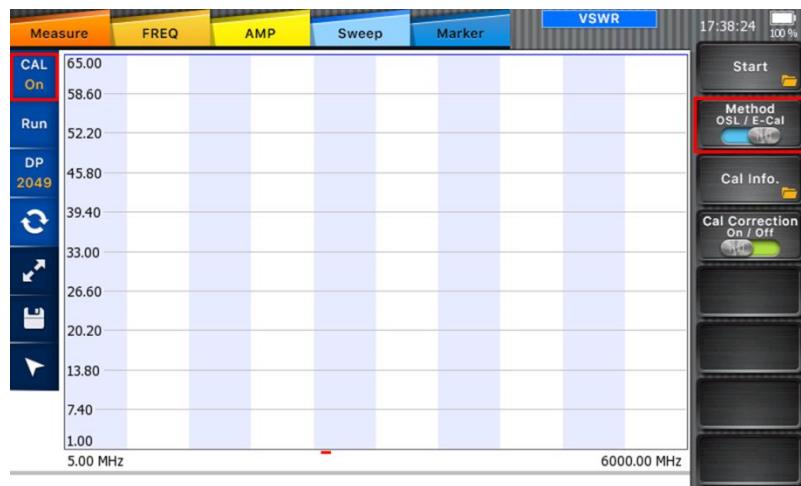
Using built-in Open-Short-Load of V95 optional electrical calibrator, you can save calibration time. Calibration using E-Cal automatically done by switching Open-Short-Load automatically,

Initialization	
<ul style="list-style-type: none"> <li>- Provide USB and connect V95 to RF port.</li> <li>- Press Initialize button to Start calibration</li> </ul>	

Calibration	
<ul style="list-style-type: none"> <li>- Press Start button to perform calibration, E-Calibration will be done automatically in the order of Open → Short → Load.</li> </ul>	

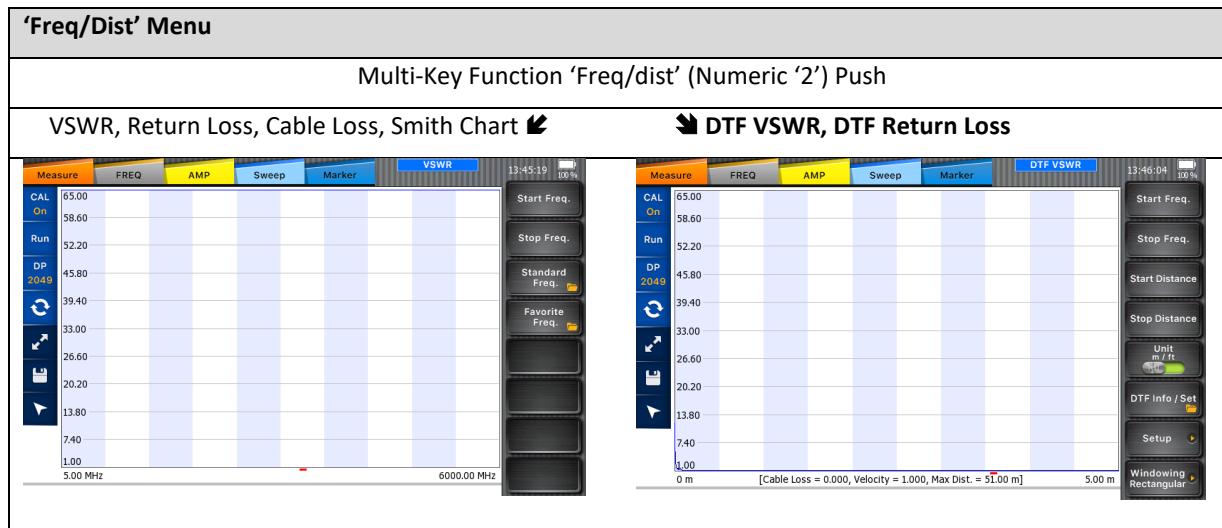


When calibration done successfully, the screen automatically returns to the measurement screen. CAL "On." Icon will be displayed.

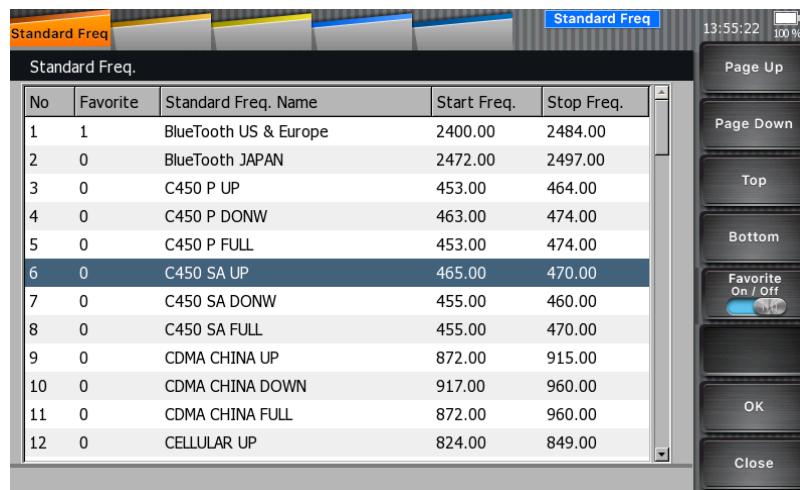


#### 4.2.2. FREQ/DIST-NUMERIC '2'

Sets the Frequency in VSWR/Return Loss/Cable Loss measurement or Distance in DTF mode.

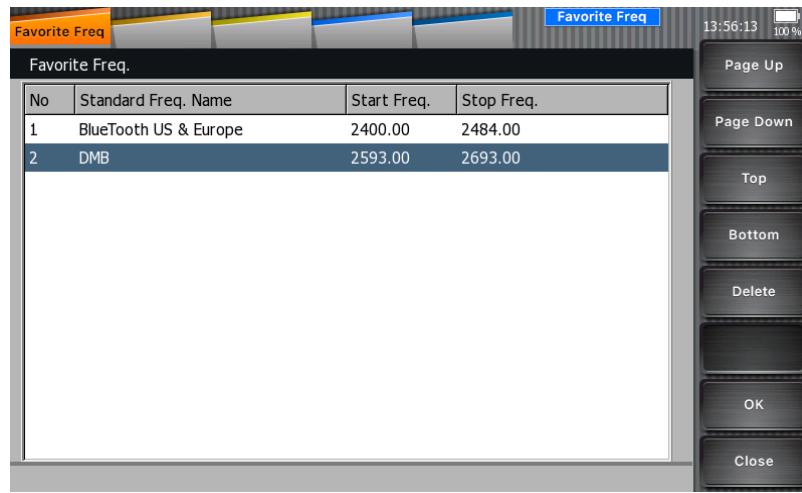


You can also set the start/stop frequency from built-in list of standard wireless communication frequency.

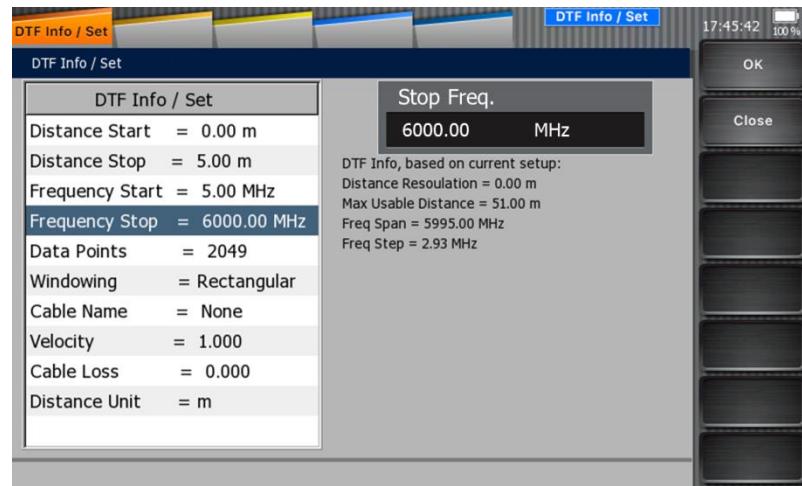


No	Favorite	Standard Freq. Name	Start Freq.	Stop Freq.
1	1	BlueTooth US & Europe	2400.00	2484.00
2	0	BlueTooth JAPAN	2472.00	2497.00
3	0	C450 P UP	453.00	464.00
4	0	C450 P DOWN	463.00	474.00
5	0	C450 P FULL	453.00	474.00
6	0	C450 SA UP	465.00	470.00
7	0	C450 SA DOWN	455.00	460.00
8	0	C450 SA FULL	455.00	470.00
9	0	CDMA CHINA UP	872.00	915.00
10	0	CDMA CHINA DOWN	917.00	960.00
11	0	CDMA CHINA FULL	872.00	960.00
12	0	CELLULAR UP	824.00	849.00

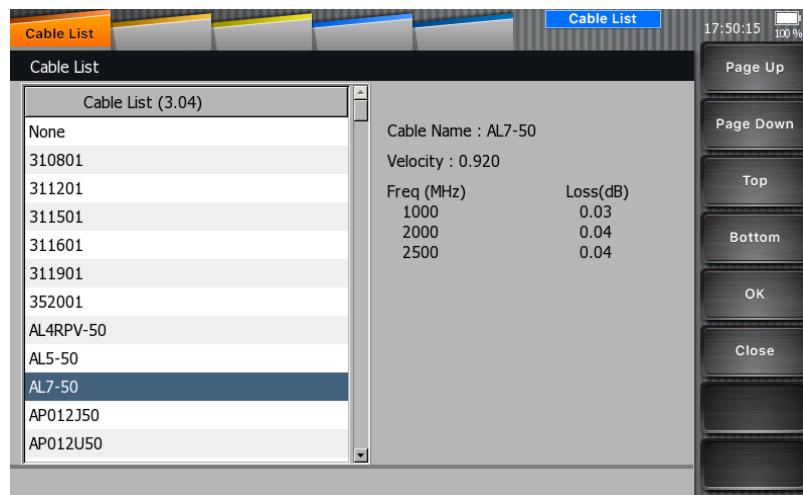
You can also register frequently used band into Favorites. Select a standard you want to register into Favorites and set 'On'.



For DTF measurement, you can set the distance (in meter or foot) for DTF VSWR and DTF Return Loss measurement.

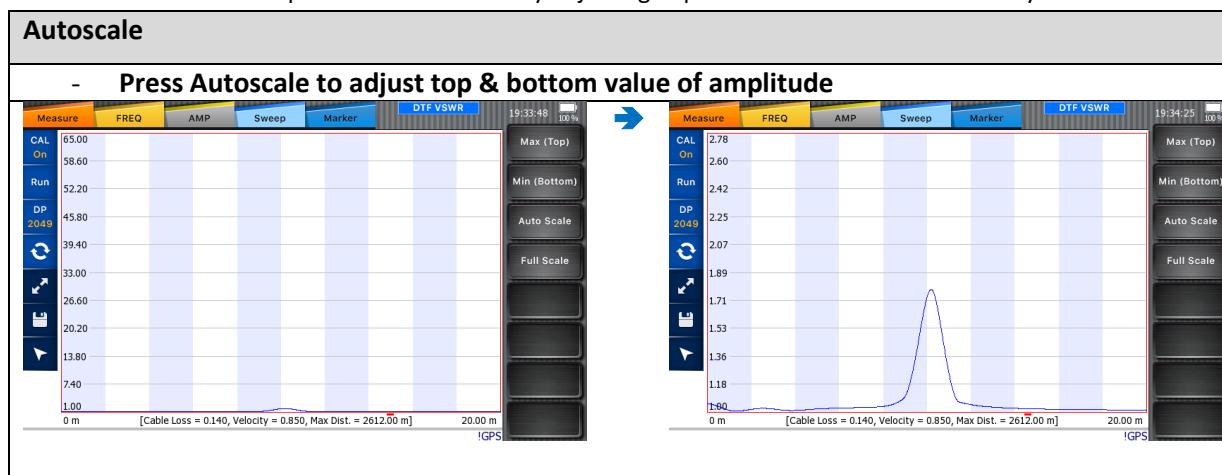


Use the Cable List saved in View9000 to select a cable to be measured.



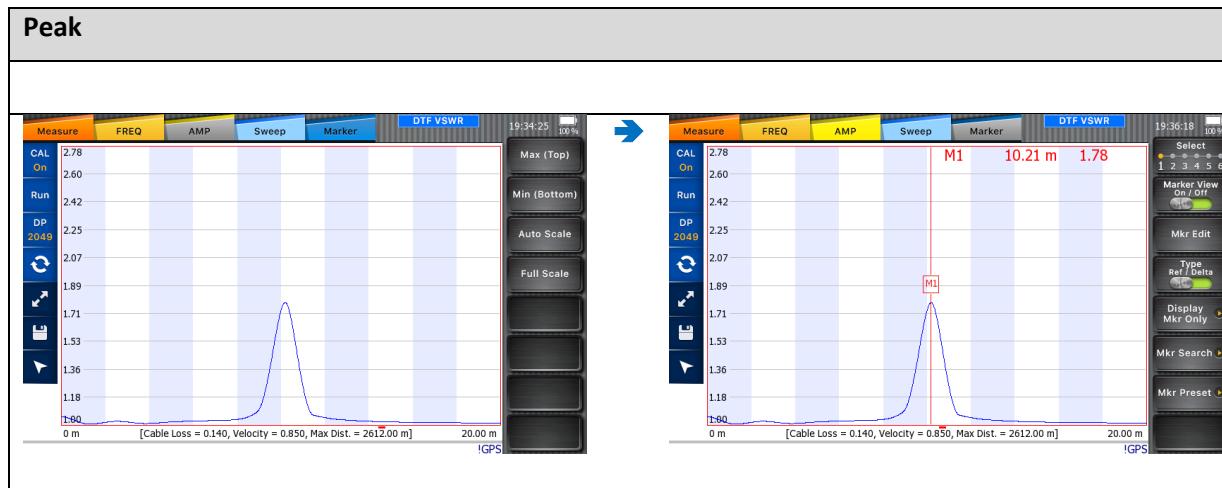
#### 4.2.3. AUTOSCALE-NUMERIC '3'

Autoscale fit the amplitude to the screen by adjusting Top & Bottom values automatically.

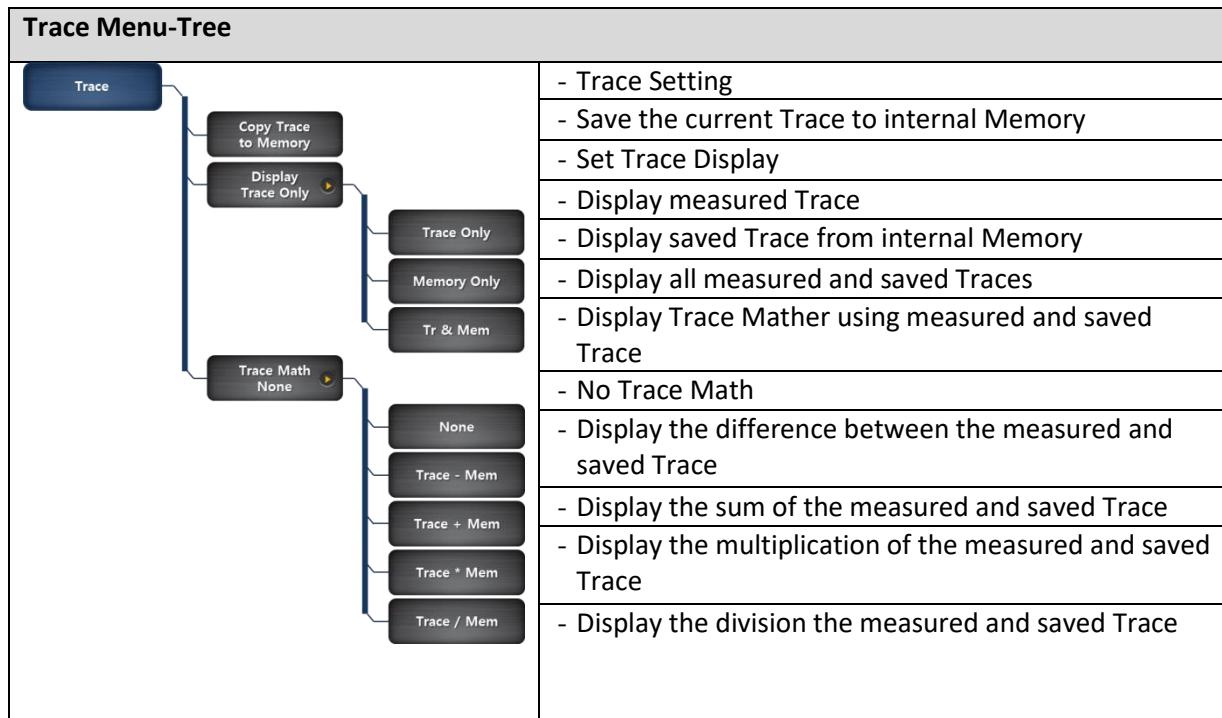


#### 4.2.4. PEAK-NUMERIC '4'

Find the peak value on the trace.



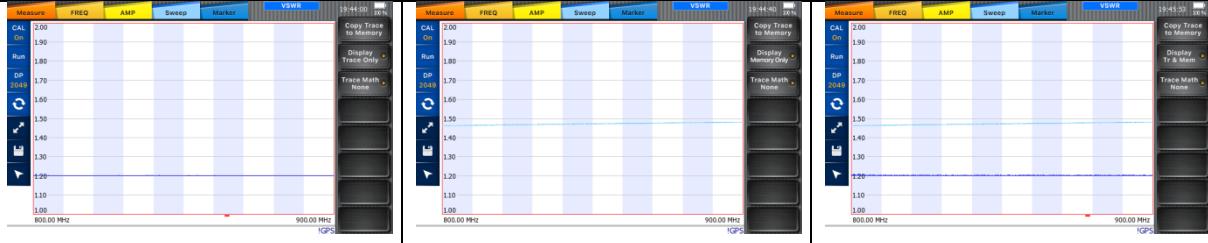
#### 4.2.5. TRACE-NUMERIC '5'



Trace>Display selects which Trace to be displayed on the screen.

### Display

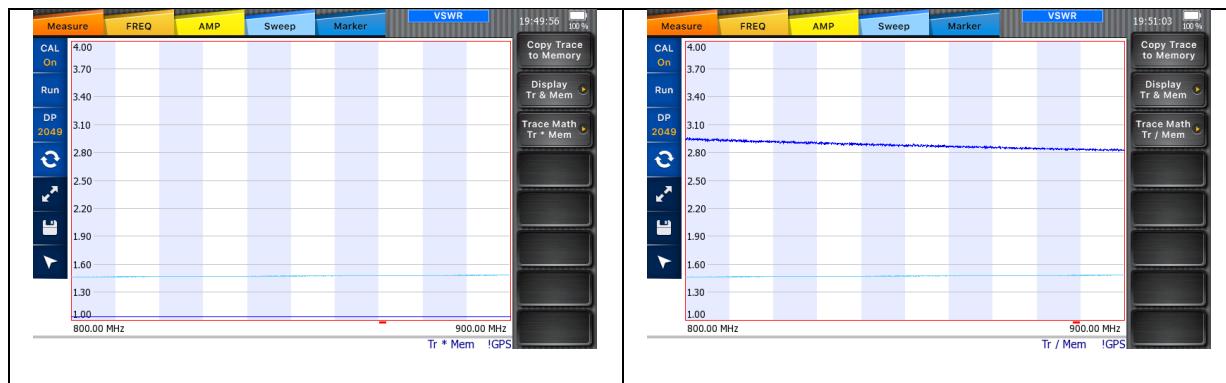
Trace	Memory	Trace + Memory
- Display the measured Trace (Blue) only	- Display the saved Trace (Yellow) from Memory only	- Display both current measured & saved Traces



Trace>Trace Math provides 4 different math.

### Trace Math

Trace – Mem	Trace + Mem
- Calculate the difference between the measured and saved Trace	- Calculate the sum of the measured and saved Trace
	
Trace * Mem	Trace/Mem
- Calculate the multiplication of the measured and saved Trace	- Calculate the division the measured and saved Trace



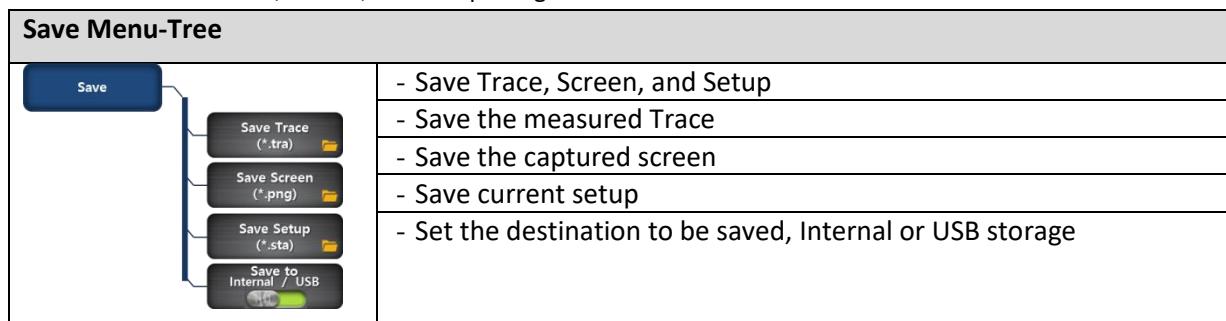
Trace Math calculations are displayed on the bottom left of the Trace chart.

#### 4.2.6. RUN/HOLD-NUMERIC '6'

Control sweep between Run and Hold, Toggle operation. Press Hold to display single sweep and Run to display continuous sweep.

#### 4.2.7. SAVE-NUMERIC '7'

You can save Trace, Screen, and Setup using Save menu.



Save		
Save Trace	Save Screen	Save Setup
<ul style="list-style-type: none"> <li>- Save the current measured Trace (*.tra)</li> </ul> 	<ul style="list-style-type: none"> <li>- Save current screen (*.png)</li> </ul>	<ul style="list-style-type: none"> <li>- Set current setup (*.sta)</li> </ul>

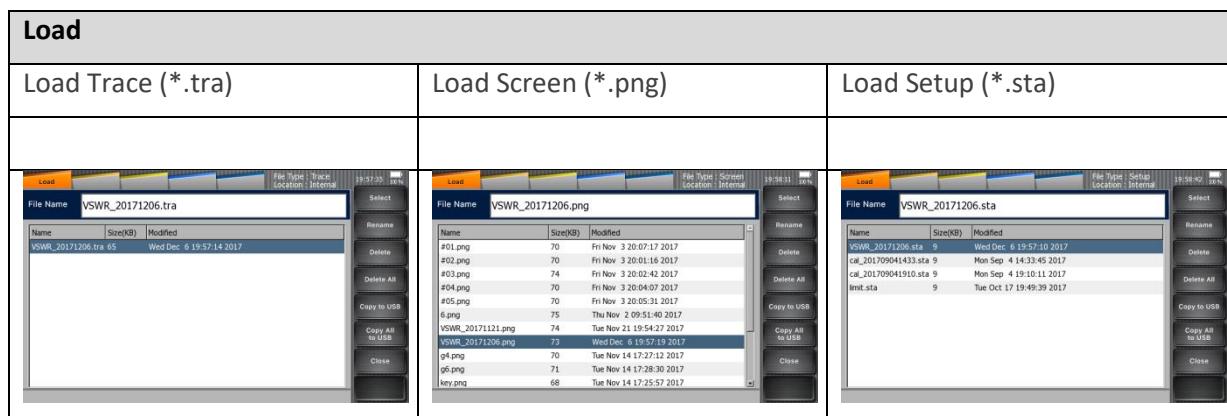
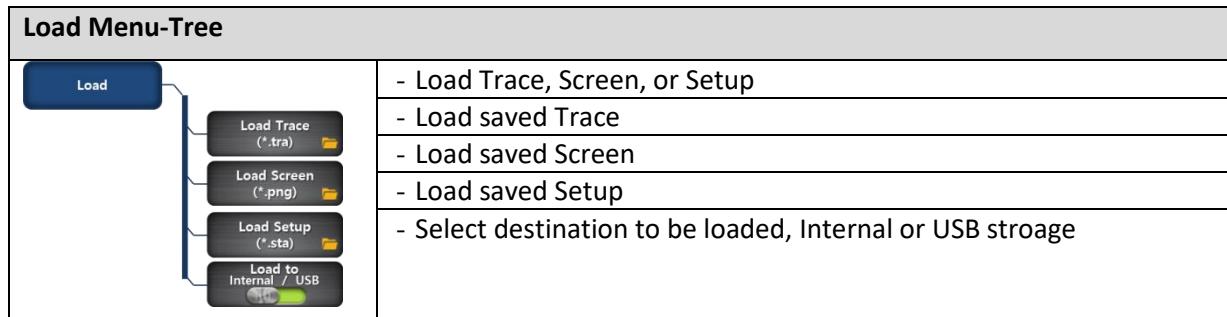
File Location can be selected using Save>Save to.

**Note**

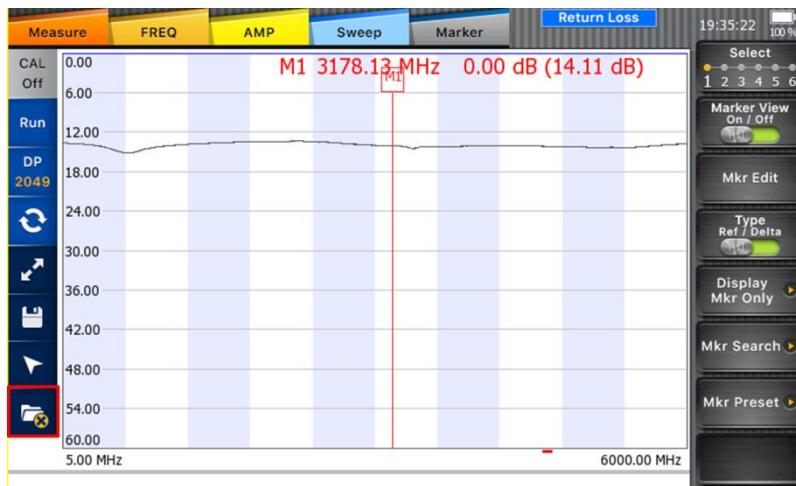
- 
- Default file name is 'measurement mode\_date (YYYYMMDD)'

#### 4.2.8. LOAD-NUMERIC '8'

Load Trace, Screen, and Setup.

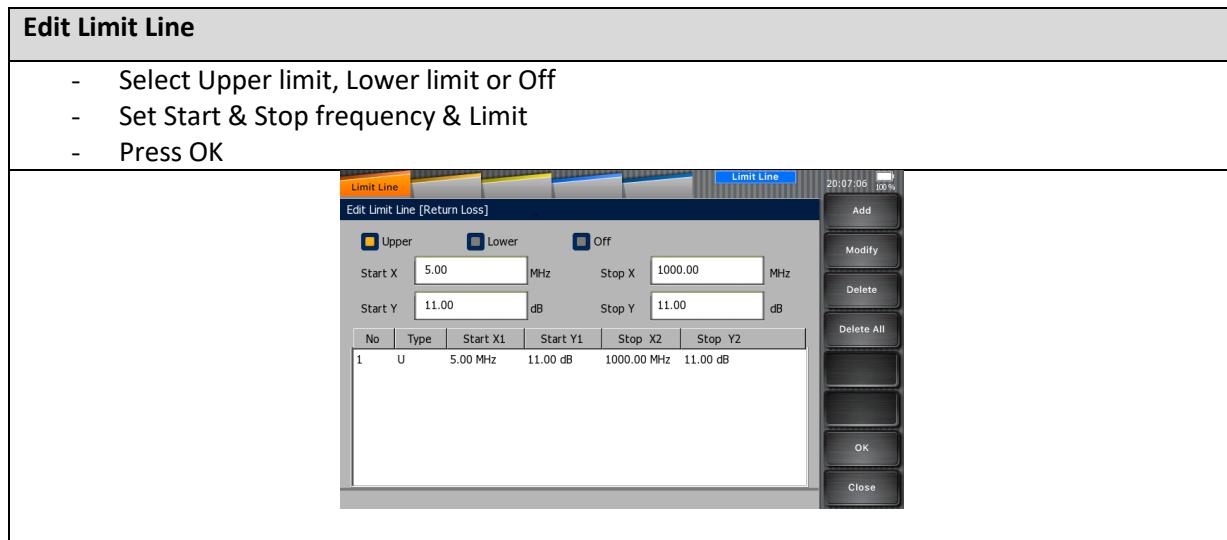
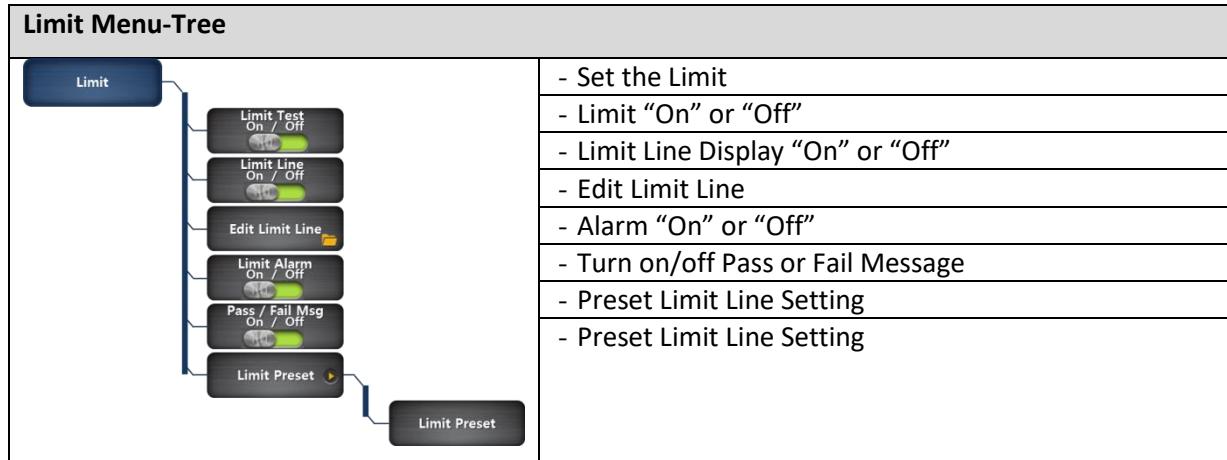


When Load Trace is executed, the saved trace in black color will be displayed on the screen as shown in the figure below. When the marker is set, the marker displays the frequency and value that are being measured currently, and the value of Loaded Trace will be displayed in parentheses. For example, M1 in the following figure is at 3178.13MHz, the current measured value is 0.00dB, and the Loaded Trace is 14.11dB.



#### 4.2.9. LIMIT-NUMERIC '9'

Set Limit line and value.



**Note**

- *Upper: Fail if the measured value is higher than the Upper Limit Line*
- *Lower: Fail if the measured value is lower than the Upper Limit Line*

Upper/Lower Limit Operation	
Lower Limit Line	Upper Limit Line
- Green line (11.0) is Lower Limit Line	- Violet line (11.0) is Upper Limit Line

#### 4.2.10. PRESET-NUMERIC '•'

Preset all the settings to the factory default.

Preset Menu-Tree	
	<ul style="list-style-type: none"> <li>- Preset</li> <li>- Run Preset</li> <li>- Confirm Preset</li> </ul>

#### 4.2.11.

##### MEAS-NUMERIC '0'

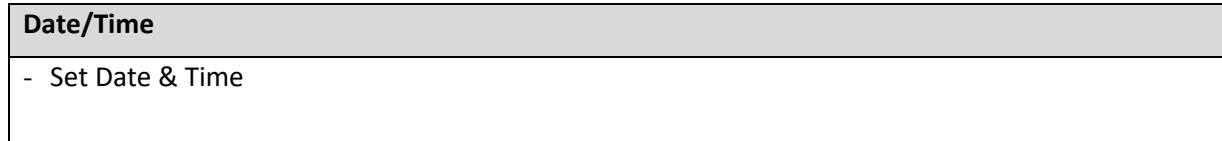
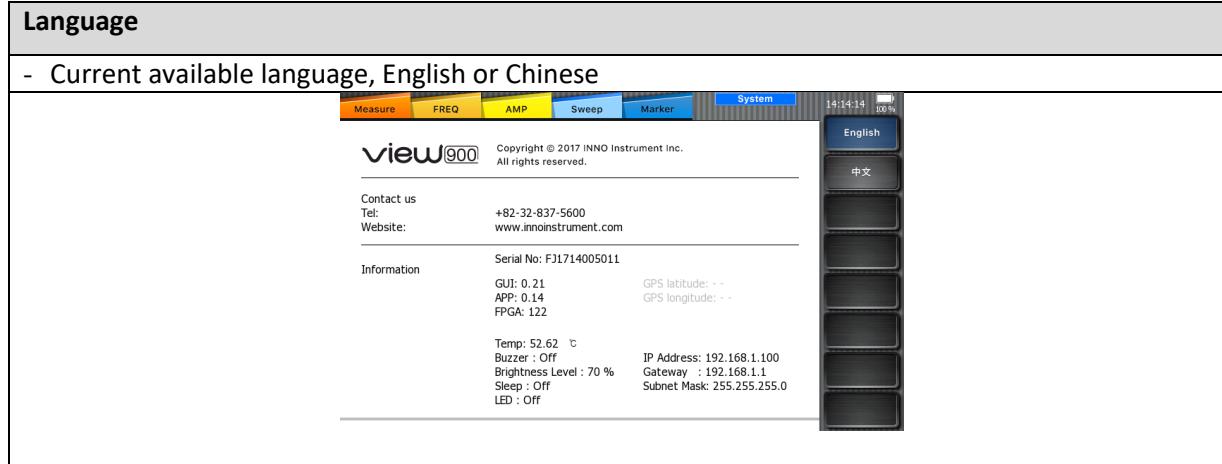
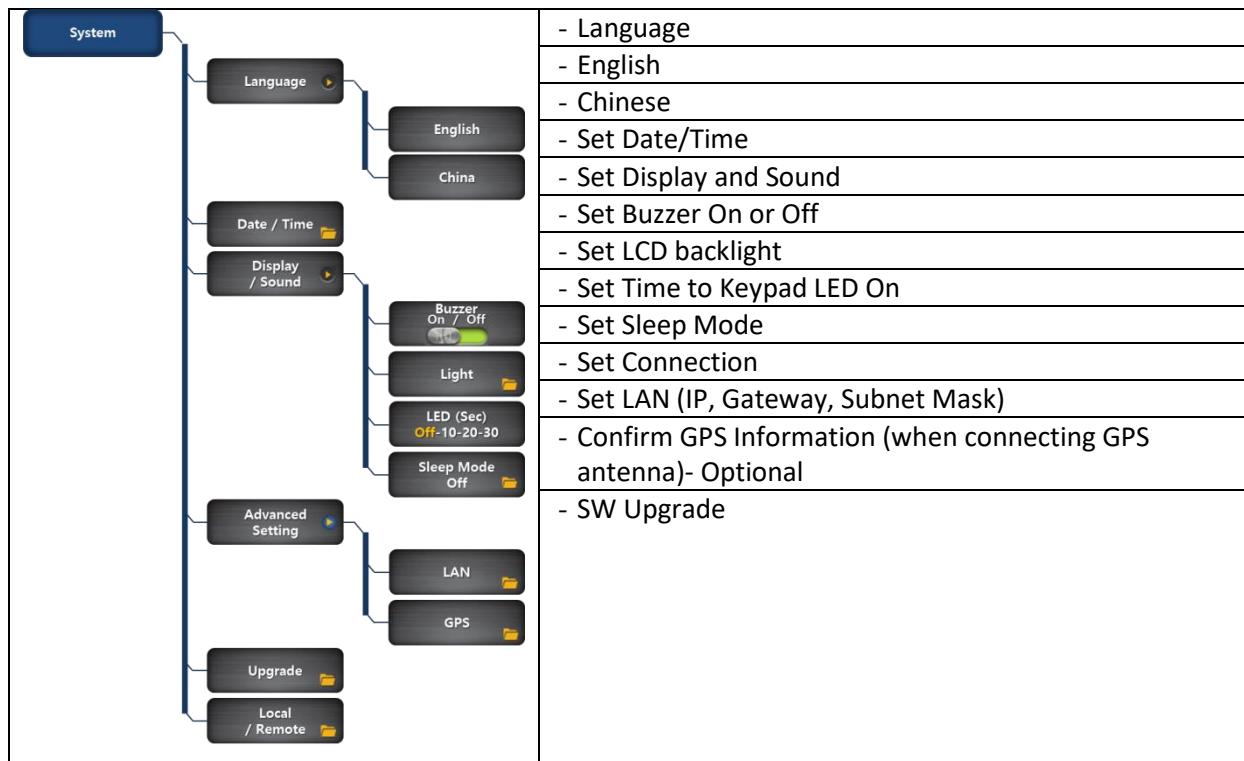
Measure button provides measurement mode such as VSWR, DTF VSWR, Return Loss, DTF Return Loss, Cable Loss, and Smith Chart.

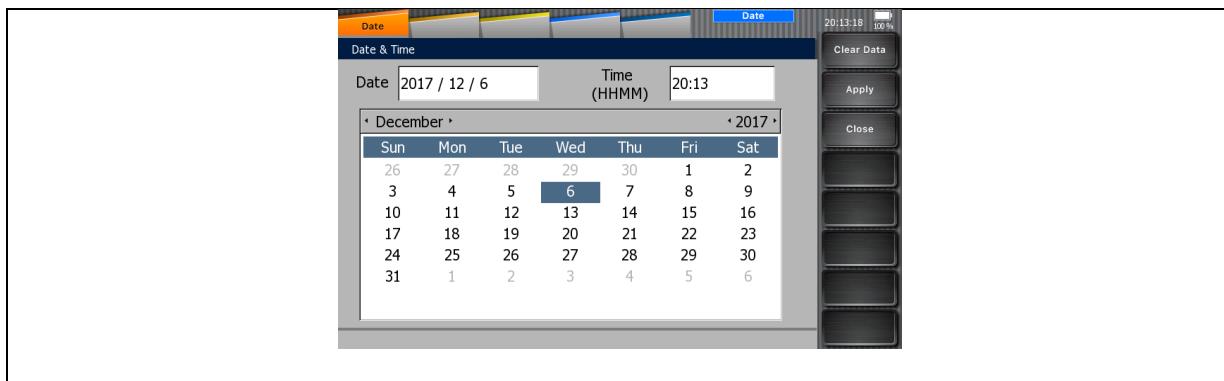
Measure Menu-Tree	
	<ul style="list-style-type: none"> <li>-</li> <li>- Select VSWR to perform VSWR measurement</li> <li>- Select DTF VSWR to perform DTF measurement in VSWR Scale</li> <li>- Select Return Loss to perform Return Loss measurement</li> <li>- Select DTF Return Loss to perform DTF measurement in Return Loss scale</li> <li>- Select Cable Loss to perform Cable Loss measurement.</li> <li>- Select Smith Chart to perform Smith Chart measurement</li> <li>- Select Single/Dual display mode to perform two measurements simultaneously</li> </ul>

#### 4.2.12. SYSTEM-NUMERIC '+/-'

System information

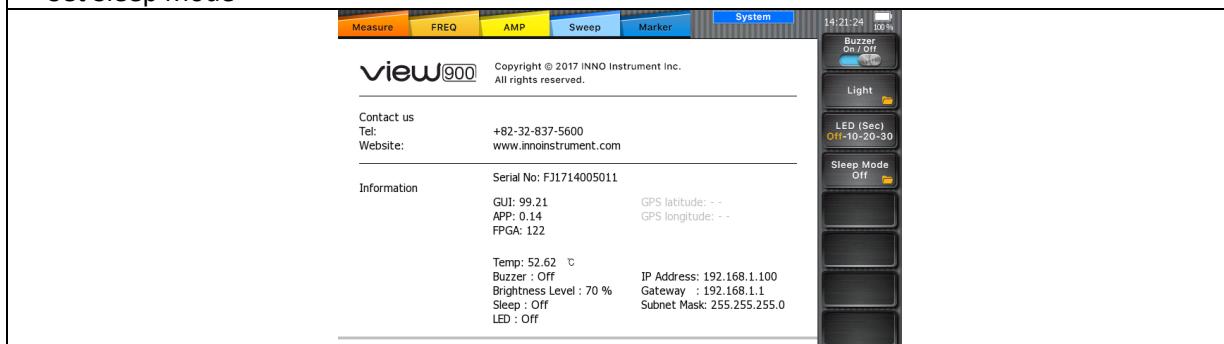
SYSTEM Side Menu-Tree	
	<ul style="list-style-type: none"> <li>- System menu</li> </ul>



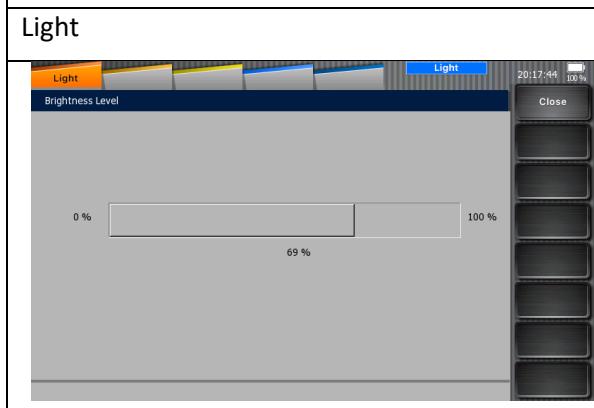


## Display/Sound

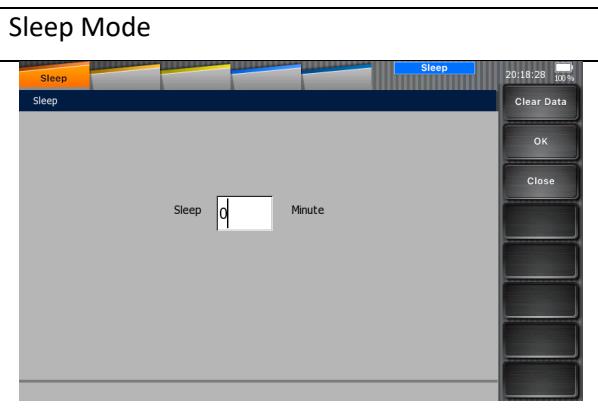
- Set Buzzer On or Off
- Set Light
- Set Keypad LED On (Off, 10sec, 20sec, 30sec)
- Set Sleep Mode

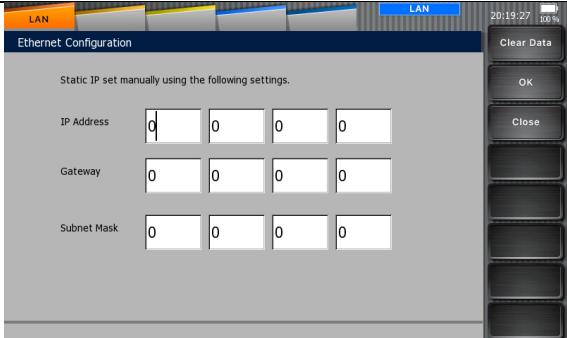
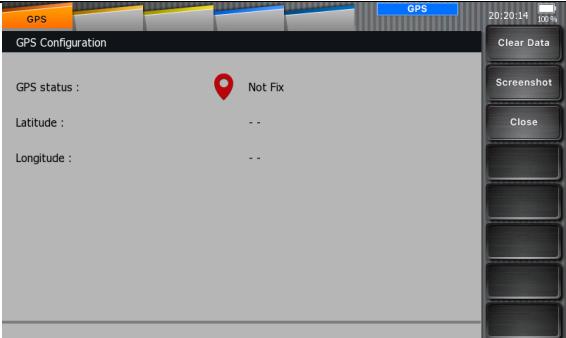


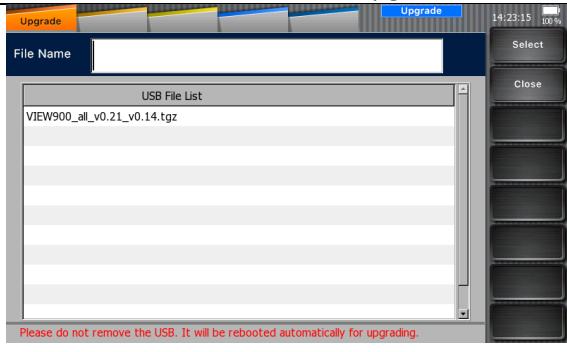
## Light



## Sleep Mode



Advanced Settings	
LAN	GPS
<ul style="list-style-type: none"> <li>- Set IP, Gateway, and Subnet Mask</li> <li>- Identical to Main Menu&gt;Setting&gt;LAN</li> </ul> 	<ul style="list-style-type: none"> <li>- Confirm GPS information (when connecting GPS antenna)</li> </ul> 

Upgrade
<ul style="list-style-type: none"> <li>- View900 SW Upgrade</li> <li>- After downloading newer version of SW, copy it to USB thumb drive, connect to View900 USB port</li> <li>- Connect USB to USB port and browse SW file from the File List</li> <li>- Upgrade and re-boot automatically</li> <li>- Check the SW version to make sure the latest version upgraded</li> </ul> 

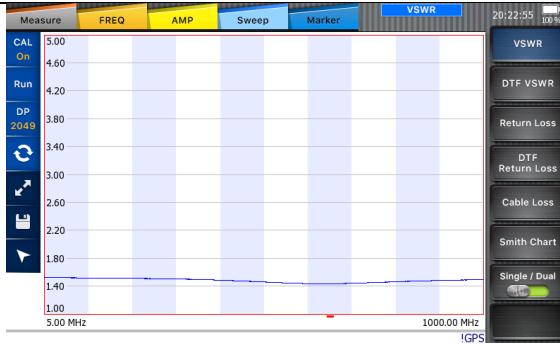
## 5. TAP MENU & MULTI FUNCTION BUTTON DESCRIPTIONS

---



## 5.1. VSWR-VSWR Measurement

Follow the procedure below to perform VSWR measurement in VSWR scale

<b>1. Mode</b>
- Menu>Measure or select '0' Meas
- VSWR
<b>2. Frequency and Sweep</b>
- Set Start & Stop Frequency
- Set Sweep Data Points
<b>3. Calibration</b>
- Perform OSL Calibration
<b>4. VSWR Result</b>
- Connect DUT (Device under test) to RF Out port and read the result


## 5.2. VSWR-Return Loss Measurement

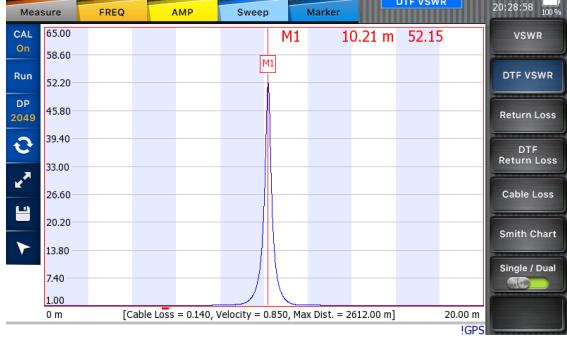
Follow the procedure below to perform VSWR measurement in Return Loss scale.

<b>1. Mode</b>
- Menu>Measure or select '0' Meas
- Return Loss
<b>2. Frequency and Sweep</b>
- Set Start & Stop Frequency
- Set Sweep Data Points
<b>3. Calibration</b>
- Perform OSL Calibration
<b>4. Return-Loss Measurement</b>
- Connect DUT (Device under test) to RF Out port and read the result



### 5.3. DTF-VSWR Measurement

Follow the procedure below to perform DTF measurement in VSWR scale

- |  |
|--|
| <b>1. Mode</b>   |
| <ul style="list-style-type: none"> <li>- Menu&gt;Measure or select '0' Meas</li> <li>- DTF VSWR</li> </ul>             |
| <b>2. Frequency and Sweep</b>  |
| <ul style="list-style-type: none"> <li>- Set Start &amp; Stop Frequency</li> <li>- Set Sweep Data Points</li> </ul>    |
| <b>3. Calibration</b>  |
| <ul style="list-style-type: none"> <li>- Perform OSL Calibration</li> </ul>  |
| <b>4. Cable</b>  |
| <ul style="list-style-type: none"> <li>- Browse cable list and select the cable to be measurement</li> </ul>           |
| <b>5. DTF-VSWR Result</b>  |
| <ul style="list-style-type: none"> <li>- Connect DUT (Device under test) to RF Out port and read the result</li> </ul> |
- 

## 5.4. DTF Return-Loss Measurement

Follow the procedure below to perform DTF measurement in Return Loss scale

### 1. Mode

- Menu>Measure or select '0' Meas
- DTF VSWR.

### 2. Frequency and Sweep

- Set Start & Stop Frequency
- Set Sweep Data Points

### 3. Calibration

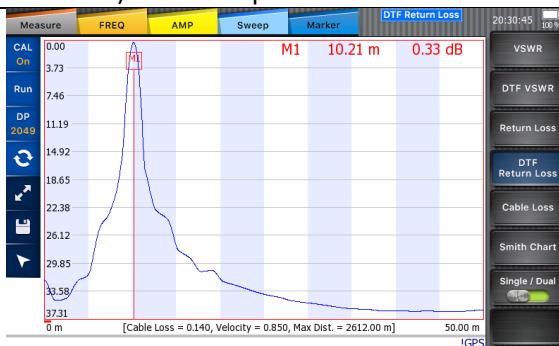
- Perform OSL Calibration

### 4. Cable

- Browse cable list and select the cable to be measurement

### 5. DTF Return-Loss Result

- Connect DUT (Device under test) to RF Out port and read the result



## 5.5. Cable-Loss Measurement

Follow the procedure below to perform DTF measurement in Return Loss scale

### 1. Mode

- Menu>Measure or select '0' Meas
- Cable Loss

### 2. Frequency and Sweep

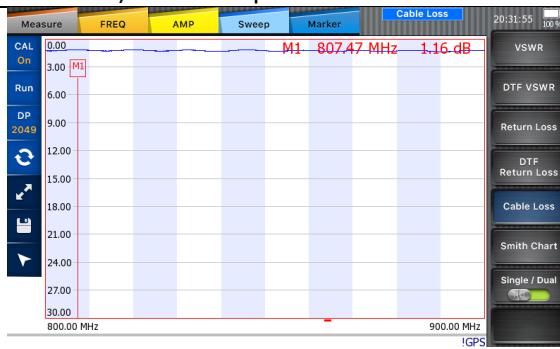
- Set Start & Stop Frequency
- Set Sweep Data Points

### 3. Conduct Calibration

- Perform OSL Calibration.

### 4. Cable-Loss Measurement

- Connect DUT (Device under test) to RF Out port and read the result



## 5.6. Smith Chart Measurement

Follow the procedure below to perform Smith Chart measurement

### 1. Mode

- Menu>Measure or select '0' Meas
- Select Smith Chart

### 2. Frequency and Sweep

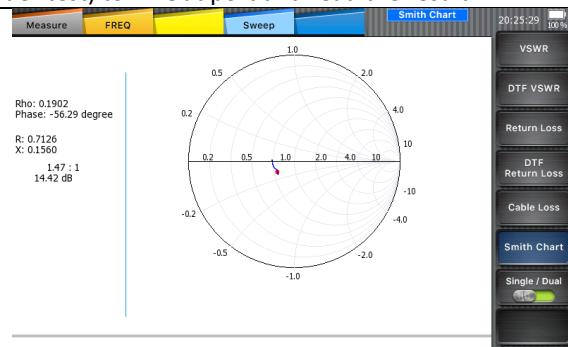
- Set Start & Stop Frequency
- Set Sweep Data Points

### 3. Calibration

- Perform OSL Calibration

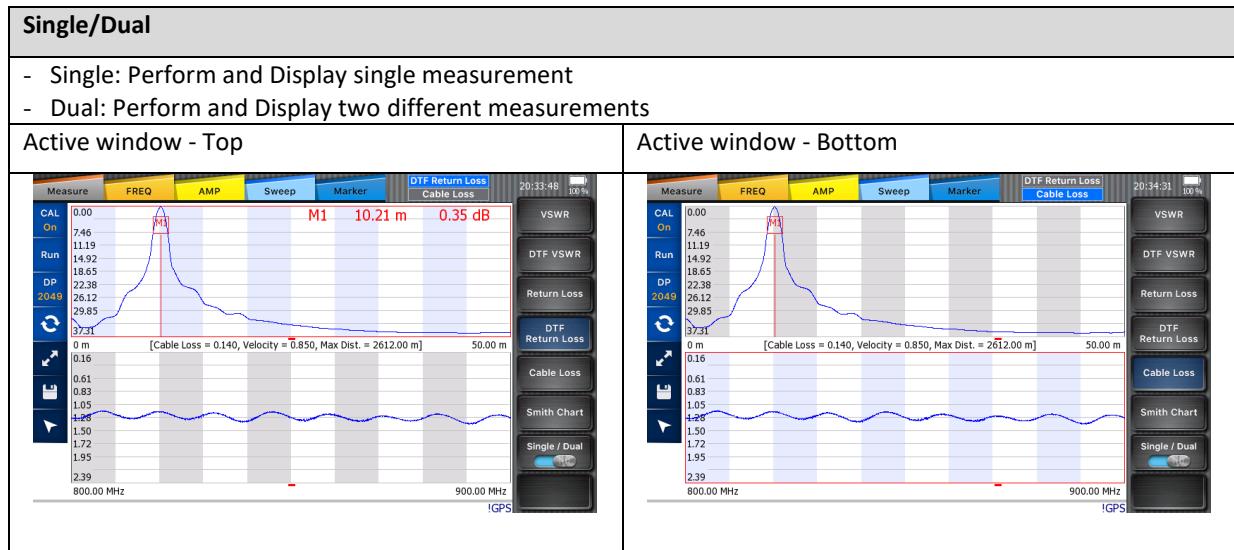
### 4. Smith Chart Result

- Connect DUT (Device under test) to RF Out port and read the result



## 5.7. Single/Dual Display

View900 support dual display to perform two measurements simultaneously. Dual display support VSWR / DTF / Cable Loss measurements and Smith Chart will not support.

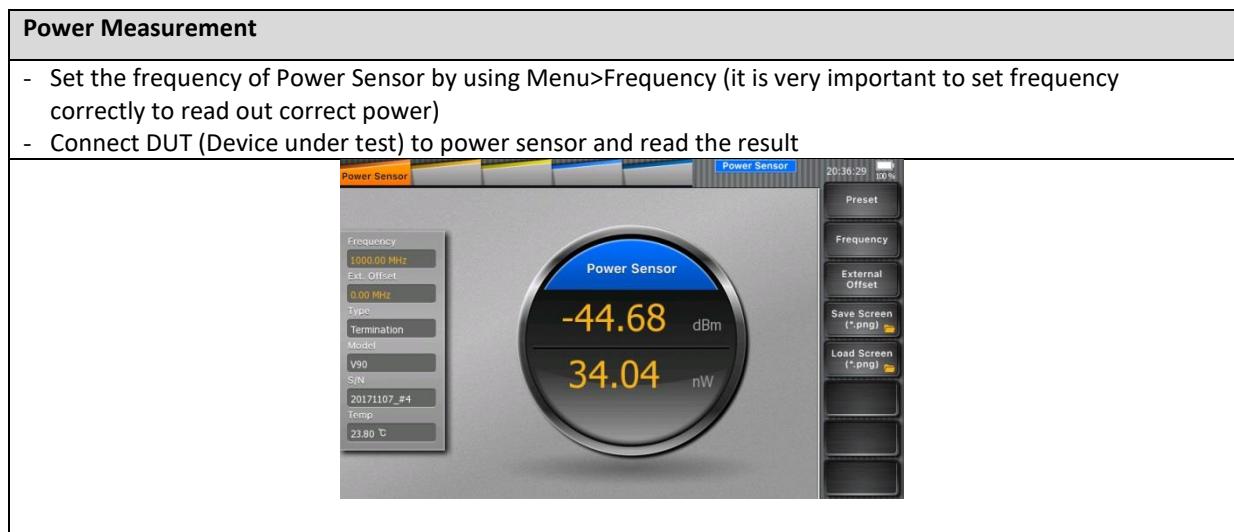


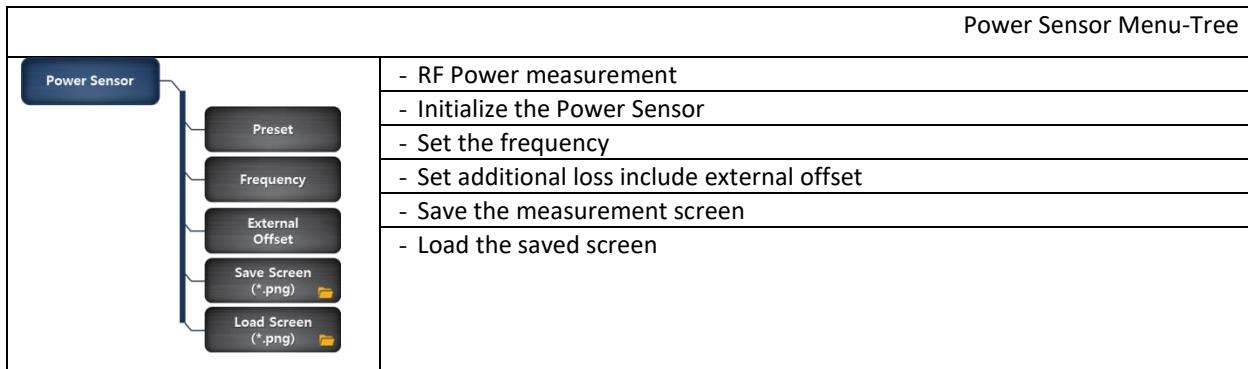
### Note

- Amplitude, marker, trace, and limit line can be set individually

## 5.8. RF Power Measurement

It provides RF power measurement using external RF power sensors.



**Power Sensor menu:**

## 5.9. Specifications

### 5.9.1. BASIC SPECIFICATIONS

Item	Sub Item	Specification
<b>General</b>	Max Input Power	+25 dBm Damage level
	Frequency Range	5 MHz to 6 GHz
	Frequency Accuracy	< ±3 ppm
	Frequency Resolution	10 kHz
	Scan Speed	< 0.7 msec /data point
	Number of data points	129, 257, 513, 1025, 2049
	Display	Single & Dual mode
	Test port	N-Type Female, 50Ω
	Save Storage (Trace / Screen / Setup)	Internal: Minimum 512 MB External: Limited by size of USB (32 G)
<b>VSWR</b>	Return Loss Range	0 to -60 dB
	VSWR Range	1 to 65
<b>Cable Loss</b>	Cable Loss range	0 to -30 dB
<b>DTF</b>	Return Loss Display Range	0 to 60 dB
	VSWR Display Range	0 to 65
	Distance Range	0 to 1250 m (4125 ft)
<b>Interference Immunity</b>	On Frequency	+5 dBm
	On Channel	+15 dBm
<b>Miscellaneous</b>	Dimension	272X188X65 mm(10.7×7.4×2.55 inches)
	Weight	2.1kg include battery
	Voltage and Current	12 Vd.c., 3.0 A
	Adaptor	100 to 240 V, 1.5 A
		12 Vd.c., 3.0 A
	Battery	Li-Ion (5.5 hr operating time after full charging), 7.4 Vd.c., 7800 mAh
<b>Environmental</b>	Operating Temperature	-10 °C ~ +50 °C
	Storage Temperature	-40 °C ~ +80 °C (-40 °F ~ +176 °F)
	Humidity	95 % R.H. Non Condensation
	Degree of protection	IPX0

### 5.9.2. V90 BASIC SPECIFICATIONS (OPTION)

Item	Sub Item	Specification
<b>Power Meter V90 (Option)</b>	Frequency Range	50 MHz to 6 GHz
	Frequency Resolution	1 MHz
	Measurement Type	Average
	Measurement Power Range	-45 dBm to +10 dBm
	Min/Max Input Power Range	-50dBm / +15dBm
	Measurement Uncertainty	±7 %
	Output Port	Precision N Male, 50 Ω
	DC Voltage	With USB Cable 5 Vdc/480 mA
	Power Consumption	0.75W (5Vdc 150 mA)
	Dimensions (LxWxH)	137x53x36 mm
	Weight	Less than 296 g
	Operating Temperature	0 °C ~ +50 °C

### 5.9.3. V95 BASIC SPECIFICATIONS (OPTION)

Item	Sub Item	Specification
<b>Electrical Cal-Kit V95 (Option)</b>	Frequency Range	5 MHz to 6 GHz
	DC Voltage	With USB Cable 5 Vdc/480 mA
	Power Consumption	0.3W (5 Vdc 60 mA)
	Dimensions (LxWxH)	113x38x27 mm
	Weight	Less than 162 g
	Operating Temperature	0 °C ~ +50 °C

## 5.10. Ordering Information

<b>Standard Configuration</b>		
View900	Cable and Antenna Analyzer View900 include: 1. View900 Cable and Antenna Analyzer, 5 MHz to 6 GHz 2. V96 Mechanical Calibration Kit 3. Soft-carrying Case	TM00900
View900B01	View900 Bundle 1 include; 1. View900, TM00900 2. USB A to USB A cable (1.0 m), TM00900900 3. RF cable DC to 8 GHz Type-N(m) to Type-N(f), 1.5 m, TM00900700	TM00900B01
<b>Optional Accessories</b>		
GPS	USB GPS Receiver and Antenna for View900	TM00900GPS
V90	Terminating Power Sensor, Type N(m), DC to 6 GHz, 50 Ω	TM00090
V95	Electrical Calibration Kit, Type N(m), DC to 6 GHz, 50 Ω	TM00095
V96	Mechanical Calibration Kit ,Type N(m), DC to 6 GHz, 50 Ω	TM00096
	Soft-carrying Case for View900	TM00900300
	Backpack carrying case for View900	TM00900301
	View900 Warranty Extension of 1yr for Asia and North America	TM00900100
	View900 Warranty Extension of 1yr for Latin America and EMEA	TM00900101
	View900 Calibration Services for Asia and North America	TM00900200
	View900 Calibration Services for Latin America and EMEA	TM00900201
	USB A to USB A cable (1.0 m)	TM00900900
	RF Cable DC to 8 GHz Type-N(m) to Type-N(f), 1.5 m	TM00900700
	Rechargeable lithium ion battery	TM00900400
	AC/DC adapter	TM00900500

### 5.10.1. SUPPLIED ACCESSORIES

The standard accessories supplied with the View900 are as follows:

- Soft-carrying case
- AC/DC adapter
- Rechargeable Li-Ion battery
- 8 GB USB memory

### 5.10.2. OPTIONAL ACCESSORIES

Description	Picture	Specification
V90 Terminating Power Sensor		<p>Frequency Range: 50MHz to 6GHz          Sensor Type: Average          Peak Power Sensor: -45dBm to +10dBm          Accuracy: ±7%          Test Port: Precision N Female</p>
V95 Electrical Calibration Kit		<p>Frequency Range: 5MHz to 6GHz          DC Voltage: 5Vd.c/500 mA          Max input Power: +20 dBm</p>
V96 Mechanical Calibration Kit		<p>Frequency Range: 5MHz to 6GHz</p>

## 6. WARRANTY INFORMATION

---



**Certificate of Warranty**

We, INNO INSTRUMENT INC. are pleased to submit Certificate of Warranty for the Products.

### 1) **Warranty Policy**

- We, INNO Instrument Inc., do hereby warrant our CAA products, be free from defects due to defective materials or workmanship for a period of 3 years from the date of shipment. With free of charge calibration can be done in headquarter, Korea for a period of 2 years.
- We, INNO Instrument Inc., do hereby warrant our CAA related accessories such as Battery, V90, V91, V95, V96 and AC adapter, be free from defects due to defective materials or workmanship for a period of 1 year from the date of shipment.  
  
During the warranty period, INNO Instrument Inc. will, at its option, repair or replace parts or products that prove to be defective.
- We, INNO Instrument Inc., are responsible for freighting(receiving and sending) the equipment that prove to be defective and all related customs, taxes, tariffs, insurance, etc. for a period of 1 year from the date of shipment.
- In cases caused by user's carelessness or after a period of 1 year from the date of shipment, the owner is responsible for freighting (receiving and sending) the equipment and all related customs, taxes, tariffs, insurance, etc.

INNO instrument Inc. will return the equipment by the same method (i.e., Air, Express, Surface) as the equipment was sent to INNO instrument Inc.. All equipment returned for warranty repair must have a valid RMA number issued prior to return and be marked clearly on the return packaging. INNO Instrument Inc. strongly recommends all equipment to be returned in its original packaging.

### 2) **Limitation of Warranty**

The obligation for INNO Instrument Inc. under this warranty is limited to repair or replacement of defective parts, and the return shipment to the buyer of the repaired or replaced parts or products. The warranty does not cover damage caused by misuse or abuse; accident; the attachment of any unauthorized accessory; alteration to the product; improper installation; unauthorized repairs or modifications; improper use of electrical/power supply; loss of power; dropped product; malfunction or damage of an operating part from failure to provide manufacturer's recommended maintenance; transportation damage or loss; theft; neglect; vandalism; or environmental conditions; or any other conditions whatsoever that are beyond the control of INNO Instrument Inc.. The warranty does not apply to any product or parts thereof where the serial number of product or any parts has been altered, defaced, or removed.

A fixed charge established for each product will be imposed for all equipment returned for warranty repair, where INNO Instrument Inc. cannot identify the cause of reported failure.

### 3) **Disclaimers and Exclusions**

The warranty described hereinabove shall be IN LIEU of any other warranty, express or implied. Except as set out hereinabove, there are NO other warranties and any statutory or implied warranty of

MERCHANTABILITY or fitness for a particular purpose is EXCLUDED from this transaction and shall not apply.

The purchaser agrees that his sole and exclusive remedy against INNO Instrument Inc. shall be for the repair or replacement of defective parts as provided hereinabove. The purchaser agrees that NO OTHER REMEDY (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available to him. The sole purpose of the stipulated exclusive remedy provided for herein, shall be to provide the purchaser with repair and replacement of defective parts in the manner provided hereinabove.

The purchaser acknowledges that no oral-statements purporting to be warranties, representations, or guarantees of any product from INNO Instrument Inc. have been made by INNO Instrument Inc. or its dealer which in any way expands, alters or modifies the terms of the warranty set out herein. Any such statements do not constitute warranties, shall not be relied on by the purchaser, and are not part of the contract of sale. This writing constitutes a complete and exclusive statement of the terms of any warranty, express or implied, of INNO Instrument Inc.

There is NO WARRANTY for any defective part of a INNO Instrument product which has been removed from its original installation site or which arises from mishandling, neglect, fire, flood, lightning, corrosive atmosphere, improper installation of the product, unauthorized modification of the product, improper fuel supply to the product, or the failure of the purchaser to properly install the product as is set out in the installation instructions.

Signed for and on behalf of  
INNO Instrument, Inc.

INNO INSTRUMENT., INC.

E-2206, Songdo Smartvalley Knowledge Industry Center 30,  
Songdomirae-ro, Yeonsu-gu, Incheon, Republic of Korea

---

Name / Department  
INNO Instrument Inc.

## 7. APPENDIX

---



**Appendix 1) Cable List**

Cable Type	Relative Propagation Velocity (V <sub>r</sub> )	Nominal Attenuation dB/m @ 1000MHz
FSJ1-50A	0.84	0.197
FSJ250	0.83	0.134
FSJ4-50B	0.81	0.119
HCC 12-50J	0.915	0.092
HCC 158-50J	0.95	0.023
HCC 300-50J	0.96	0.014
HCC 312-50J	0.96	0.013
HCC 78-50J	0.915	0.042
HF 4-1/8" Cu2Y	0.97	0.01
HF 5" Cu2Y	0.96	0.007
HF 6-1/8"Cu2Y	0.97	0.006
HJ4.5-50	0.92	0.054
HJ4-50	0.914	0.087
HJ5-50	0.916	0.042
HJ7-50A	0.921	0.023
LDF12-50	0.88	0.022
LDF4-50A	0.88	0.077
LDF5-50A	0.89	0.043
LDF6-50	0.89	0.032
LDFF7-50A	0.88	0.027
LMR100	0.8	0.792
LMR1200	0.88	0.044
LMR1700	0.89	0.033
LMR200	0.830	0.344
LMR240	0.84	0.262
LMR400	0.85	0.135
LMR500	0.86	0.109
LMR600	0.87	0.087
LMR900	0.87	0.056
RG142	0.69	0.443
RG17, 17A	0.659	0.18
RG174	0.66	0.984
RG178B	0.69	1.509
RG187, 188	0.69	1.017
RG213/U	0.66	0.292
RG214	0.659	0.292
RG223	0.659	0.165
RG55, 55A, 55B	0.659	0.541
RG58, 58B	0.659	1.574

RG58A, 58C	0.659	0.787
RG8, 8A, 10, 10A	0.659	0.262
RG9, 9A	0.659	0.289
HFSC-12D (1/2")	0.81	0.112
HFC-12D(1/2")	0.88	0.072
HFC-22D (7/8")	0.88	0.041
HFC-33D (1_1/4")	0.88	0.0294
HFC-42D (1_5/8")	0.87	0.0243
RFCX-12D (1/2")	0.88	0.088
RFCX-22D (7/8")	0.88	0.049
RFCX-33D (1_1/4")	0.88	0.038
RFCX-42D (1_5/8")	0.87	0.028
RFCL-22D (7/8")	0.88	0.044
RFCL-33D (1_1/4")	0.88	0.034
RFCL-42D (1_5/8")	0.87	0.0315

[www.innoinstrument.com](http://www.innoinstrument.com)



You dream,  
we DESIGN

Visit us on Facebook  
[www.facebook.com/innoinstrument](https://www.facebook.com/innoinstrument)

Copyright © 2018 INNO Instrument Inc. All rights reserved.  
E-22F, 30, Songdomirae-ro, Yeonsu-gu, Incheon 21990, Republic of Korea  
tel 82-32-837-5600 fax 82-32-837-5601

Product specifications and descriptions in this document subject to change without notice.

Printed in Korea [www.innoinstrument.com](http://www.innoinstrument.com)