

AC-726

CABLE AND ANTENNA ANALYSER



USER'S MANUAL VERSION

Version	Date	Software Version
1.0	April 2016	152.100.100

SAFETY RULES

Safety Instructions

During each stage of operation of this instrument, please always observe the following safety instructions. Not taking any safety precautions or following the instructions will violate the safety standards of design, manufacturing and application of these instruments. In no case will PROMAX bear the responsibilities for consequences incurred by violation of the following instructions.

General

This product is a Safety Class 1 instrument. The protective features of this product may be impaired if it is used in a manner not specified in the operation instrument.

Environmental conditions

It is designed to operate at a maximum relative humidity of 95% and at altitudes of up to 2000 meters. Refer to the specifications tables.

Before applying power

Verify that the product is set to match the available line voltage, the correct fuse is installed, and all safety precautions are taken. Note the instrument's external markings described under Symbols.

Do not operate in an explosive atmosphere

Do not operate the instrument in the presence of flammable gases or fumes.

Do not remove the instrument cover

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified service personnel. Instrument that appears damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

Electrical safety precautions

If you need to ensure that the equipment completely off, unplug the power line and remove the battery.

Warning

Only using the AC/DC power adapter in the room.

The equipment should be placed where the surrounding air can flow freely.














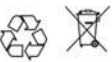
Do not operate equipment in the flammable gas or near the smoke.

Do not operate equipment if any part of outer surface (upper cover panel, etc.) damaged, To avoid the electric shock.

Only approved professional personnel can open and debug and maintenance or repair the equipment when its power supply is turned on.

Even turn off the power supply, equipment still be in a charged state over a period of time due to internal capacitor.

* Symbols related with safety:

	DIRECT CURRENT		ON (Supply)
	ALTERNATING CURRENT		OFF (Supply)
	DIRECT AND ALTERNATING		DOUBLE INSULATION (Class II protection)
	GROUND TERMINAL		CAUTION (Risk of electric shock)
	PROTECTIVE CONDUCTOR		CAUTION REFER TO MANUAL
	FRAME TERMINAL		FUSE
	EQUIPOTENTIALITY		EQUIPMENT OR COMPONENT TO BE RECYCLED

Descriptive Examples of Over-Voltage Categories

Cat I Low voltage installations isolated from the mains.

Cat II Portable domestic installations.

Cat III Fixed domestic installations.

Cat IV Industrial installations.

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CABLE AND ANTENNA ANALYSER

AC-726

1 GENERAL INFORMATION

1.1 **Scope of this information**

Thank you for purchasing Promax instrument. Please read this manual carefully before using any of Promax instrument. Always observe the warnings and cautions appearing throughout this manual.

This manual contains the information necessary for proper operation and maintenance of AC-726 instrument, troubleshooting instructions as well as information regarding obtaining services.

1.2 **Unpacking and Inspection**

This instrument has been carefully packed in accordance with standard shipping procedures. Examine the instrument for damage that may have occurred during shipment. If you find any damage or the instrument is not working, or if any of the following items are not included, please contact your representative of Promax.

1.3 **Product Introduction**

AC-726 product is portable, easy to learn and use. Has the characteristics of powerful function, fast operation, integrated intelligent etc.

AC-726 product is equipped with a large and easy to read color LCD which can display the measurement data, trace and figure. This product has rich peripheral interface, users can easily backup or upload data. It is also equipped with a special PC software with which users can analyze, print, record and archive measuring data and report with PC management and analysis software. Large capacity battery, support more than 8 hours of continuous work if charged fully.



2 EQUIPMENT DESCRIPTION

2.1 The head cover

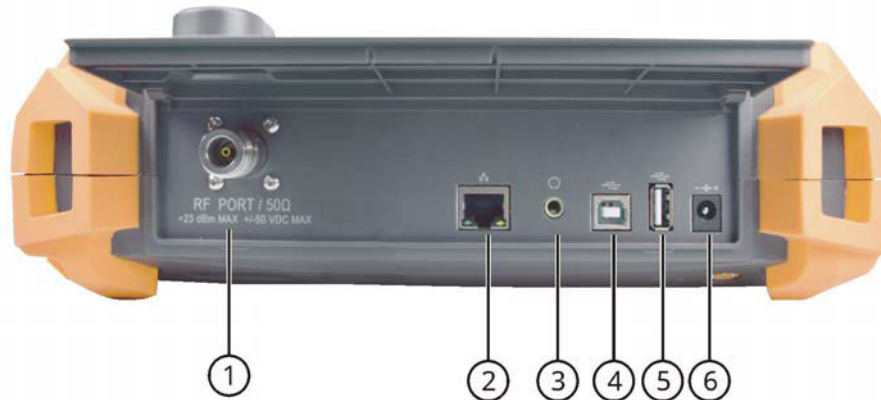


Figure 1.

The head cover contains a variety of interface. A detailed description of the following.

- ① **RF connector:** To connect cable and antenna unit to be tested.
- ② **RJ45 LAN:** Reserved.
- ③ **Ear socket:** Reserved.
- ④ **USB Device port:** To connect PC, then users can run special software to analyze and manage measurement data.
- ⑤ **USB host port:** To connect flash disk.
- ⑥ **Adapter socket:** To connect external AC-DC adapter.



2.2 Front panel



Figure 2.













- ① Screen display area
- ② Indicator LED
- ③ Power ON (short press) / OFF (long press)
- ④ Keypad
- ⑤ Pen holder

Description for indicator lights:

Position	State	Meaning
Left	Red	Battery Charging...
	Green	Battery Charge fully
Right	Off	Power off
	Green	Power on
	Red	Measuring...



Description for hard keyboard:

	Adjust the display screen brightness, there are four levels.
	Switch display mode (black and white, normal, night vision, and high contrast).
	Preview, save the measurement picture.
	Save calibration and measurement curve.
	Popup or down the right menu.
	Quick start measurement.
	Backspace.
	Return to the previous interface.
	Left and right move marker line.
	Up and down move limit line.
	Enter key.
	Digital key, input 0-9.
*	Decimal point.
#	Minus sign.



3 USER INTERFACE AND MENU INSTRUCTIONS

3.1 Turn on the instrument

Press Φ , equipment will display the boot picture. During startup, the right light turns red, the system will initialize DSP system, self check system state, etc. When main interface appear, the boot process end, the right light turns green.



Figure 3.: Main interface



3.2 Main interface

Click "MEASUREMENT" Icon, 5 sub-icons appear, corresponding to the five measurement modes: DTF (distance fault) return loss, DTF-VSWR, Frequency return loss, Frequency-VSWR, cable loss. Click the icon, the system will go into the corresponding measurement interface.

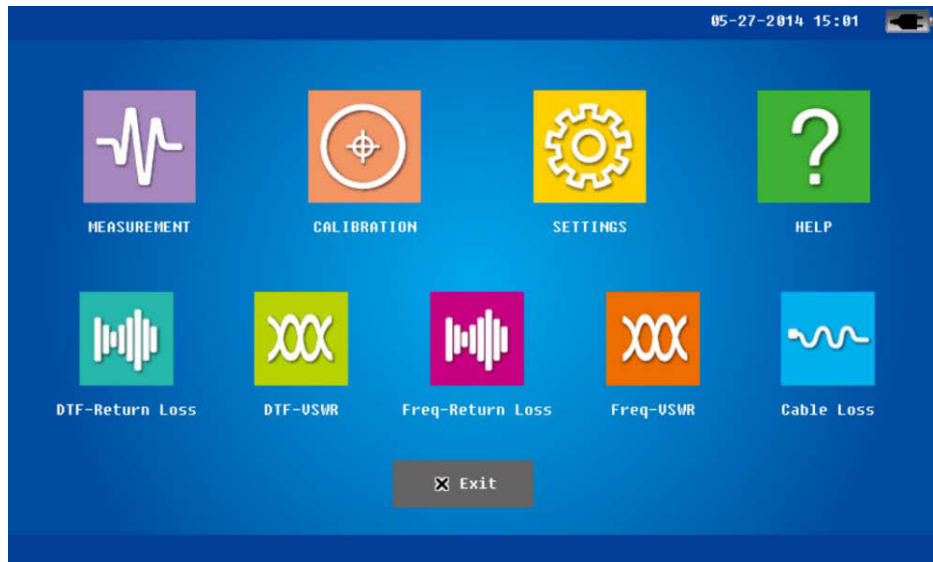


Figure 4.: Main interface

NOTE: Click other icons in the main interface (CALIBRATION, SETTINGS, HELP), system will enter the corresponding operation interface.



3.3 Measurement Interface

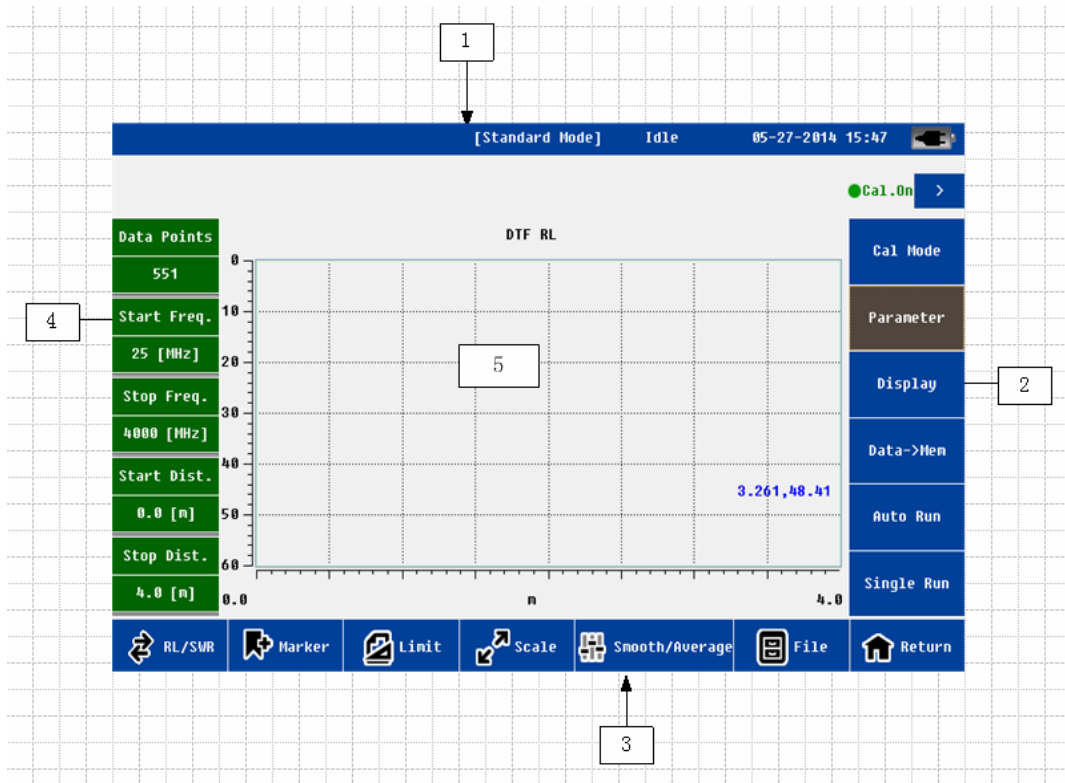


Figure 5.

Measurement interface mainly consists of the following parts:

No.	Name	Position	Function and Description
1	Status bar	Top	Display the system status and measurement information.
2	Function menu	Right	For details, see the later chapter. Note: If some menu are selected, this part may will refresh.
3	Function menu	Bottom	For details see later chapter.
4	Message bar	Left	Frequency, distance, measuring points etc.
5	Display area	Middle	For details see later chapter.

If the user wants to zoom in the display area, can click the arrow or "Nav" key. Click again the area will zoom out.



Detailed description:

Function	Function and Description.
Status bar	Power management mode: standard and power saving mode.
	Measurement state: idle and measuring.
	Time: year/month/date/hour/minute.
	The adapter and battery state: <ol style="list-style-type: none"> 1. Connect an external adapter, without battery - display adapter icon; 2. Connect an external adapter, with battery charging - display charging icon; 3. Connect an external adapter, with battery full - display adapter icon; 4. Without adapter, only battery - display battery icon, divided into 5 levels. If battery is low voltage system will alarm.
	Calibration state: (valid)On or (unvalid) off Note: Only when calibration is valid (on), user can start measurement.
	Marker information.
	Limit line information.
Measurement information	Measurement points: 137, 275, 551, 1103.
	Start and stop frequency and distance.
Function menu 1	Cal mode: enter calibration interface.
	Parameter: enter parameter setting menu. If user in the freq-return loss/ freq-VSWR/cable loss measurement mode, it will go into frequency parameter setting menu; If user in the DTF-return loss/DTF-VSWR measurement mode, it will go into DTF parameters menu, more parameters and information will be included in this menu.
	Display: For details see later chapter.
	Data-> Mem: Save current data to memory. Note: only one data can be save to the memory.
	Auto Run: Start continuous measurement, clicks again to stop. Note: While measuring and Auto Run state is on, some functions are prohibited. If users want to use these function again, need to click the menu once again and check the state is off.
	Single run: Start single measurement, the system enters the idle state after measurement.



Function menu 2	RL/SWR: fast switching between the return loss and VSWR measurement.
	Marker: For details see later chapter.
	Limit: For details see later chapter.
	Scale: For details see later chapter.
	Smooth/Average: turn on/off Smooth/Average function. User can utilize these function to observe and analyze measurement dat.
File: For details see later chapter.	
Main display area	Display the measurement results and other information.

3.4 The function menu description

3.4.1 Marker

In all five measurement mode users can use mark function. The user click "marker" menu, new mark menu will appear on the right side of screen.

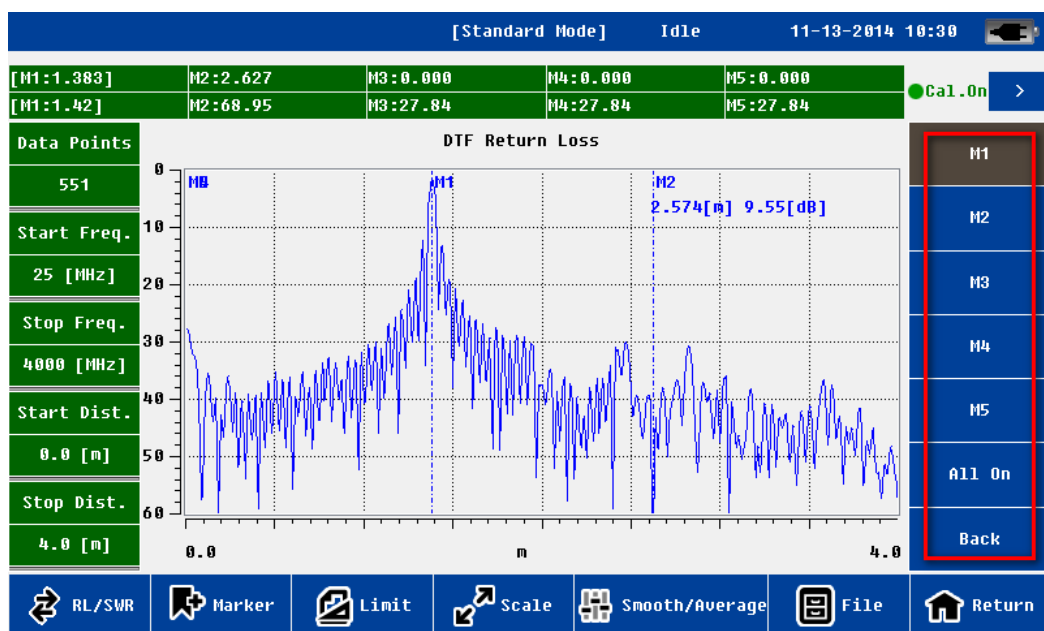


Figure 6.

The system supports 5 marker lines (M1, M2, M3, M4, M5), each marker can be independent turn on/off and edited. The user can also close all markers.

The user clicks on "MX", the MX marker automatically is activated. The status will be shown on the top status bar. Users click on the "Edit" menu, the edit menu will show on the left side of the main display area.

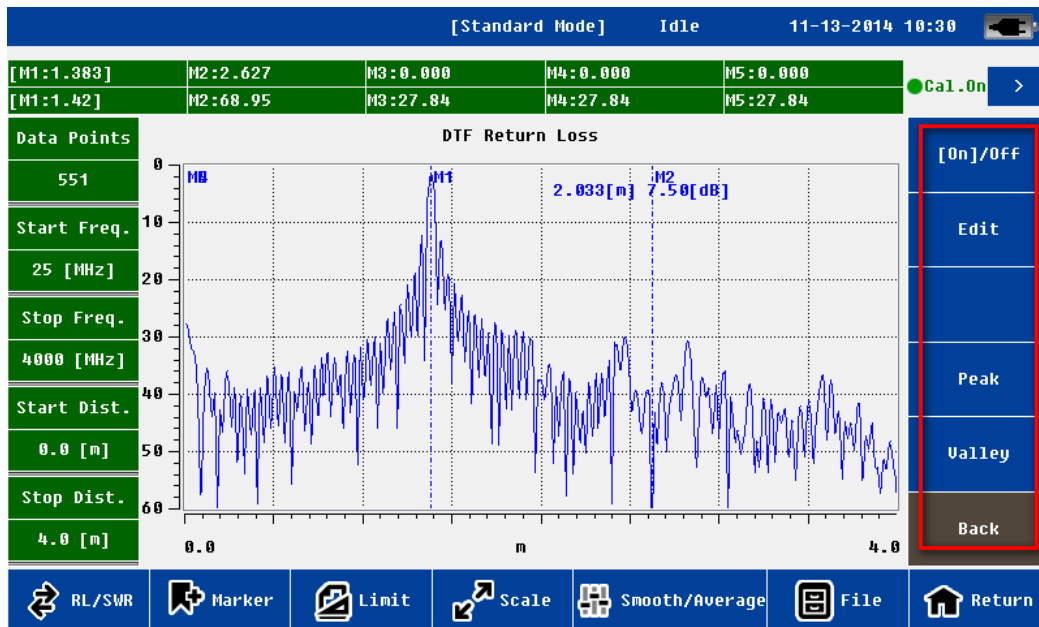


Figure 7.: Marker setting menu

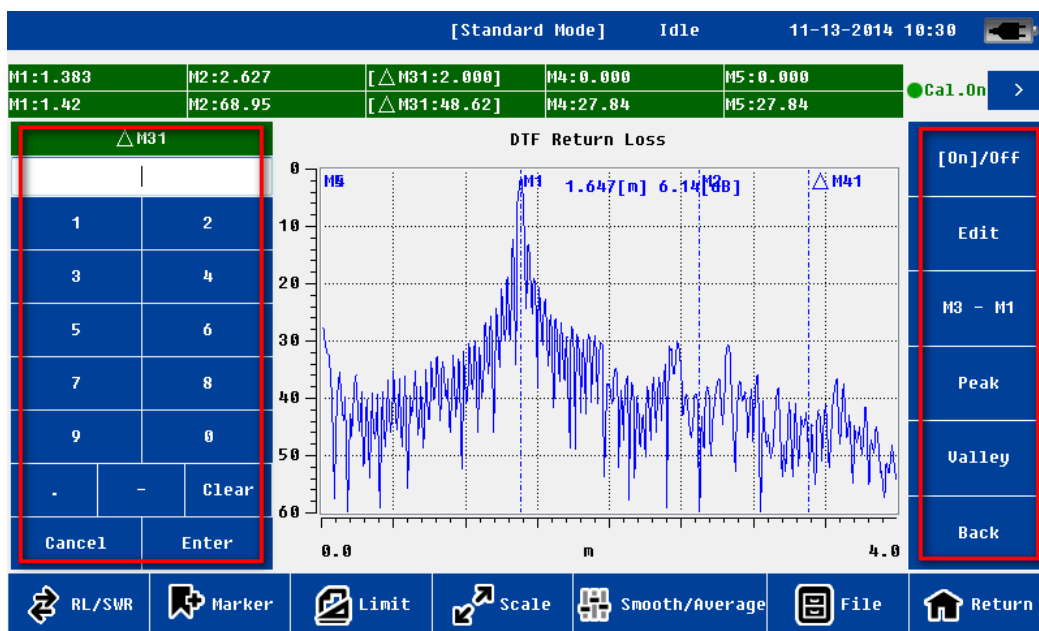


Figure 8.: Marker setting menu

The user can define the position of marker line by the following ways:

- ▶ The soft keyboard to enter digital value.
- ▶ The hard keyboard to enter digital value.
- ▶ Touch screen directly with touch pen to move and define the location.
- ▶ Left and right arrow key of hard keyboard to fine adjust and define the location.



After the location of the mark line is determined, users need to confirm the operation (soft keyboard "Enter" key or hard keyboard "OK" key).

Users also can click on the "mark to the peak" or "mark to the valley" to determine the location of the mark line.

For M2~M5, the system also supports difference marker relative to M1. Users click on the "MX-M1", the system will go into the difference marker mode. The status displayed in the status bar is the difference between X and Y direction, i.e. (MX2~5-MX1; MY2~5-MY1).

3.4.2 Limit Line

In all five measurement mode users can use limit line function. The user click on the "limit" menu, the limit menu will appear on the right side of screen. The user click on the "[On]/off" menu and activate this function. The limit line status information will display on the top of the screen.

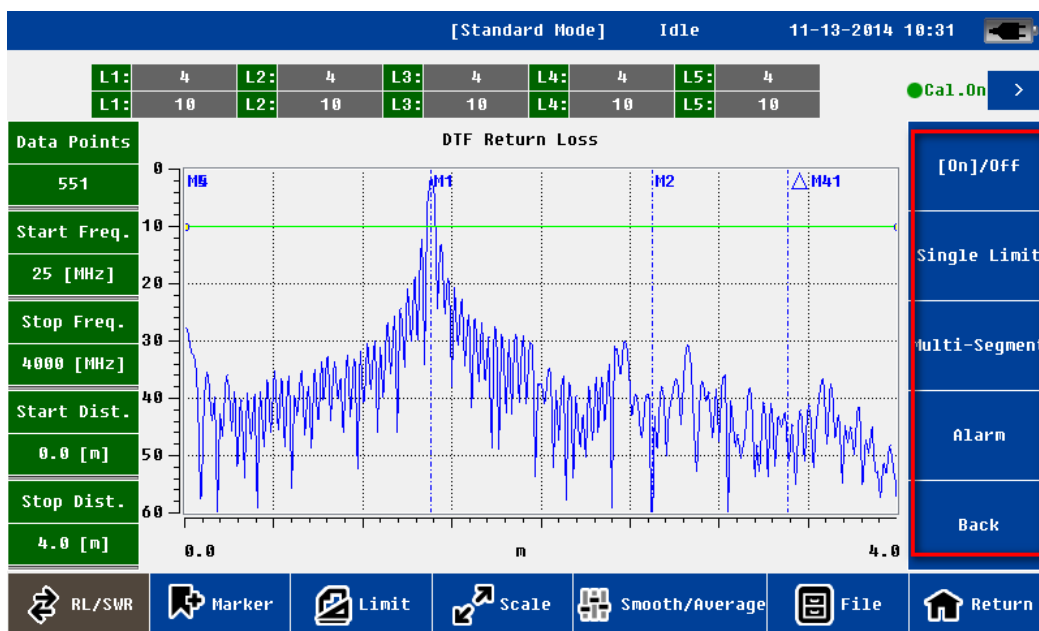


Figure 9.: Limit menu

System supports single section and multi section limit line.

The user clicks on edit box of limit line status(x, y independently), the new edit menu will pop-up on the left of the screen.

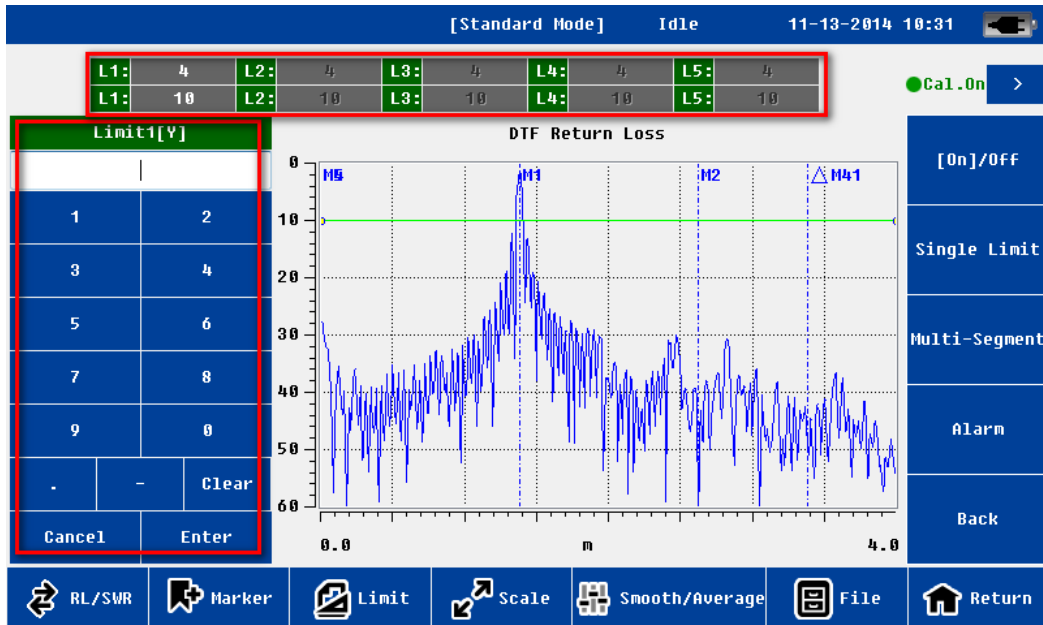


Figure 10.: Limit setting menu

The user can define the limit line position by the following ways

- ▶ The soft keyboard to enter digital value
- ▶ The hard keyboard to enter digital value
- ▶ Touch screen directly with touch pen to move and define the location
- ▶ Up and down arrow key of hard keyboard to fine adjust and define the location

After the location of the limit line is determined, users need to confirm the operation (soft keyboard "Enter" key or hard keyboard "OK" key).

Users can also enable the limit line alarm function. If this function is enabled, once the measurement data exceeds the limit line, limit line color will turn red (the default is green).



3.4.3 Scale

Scale function is mainly used to adjust the Y axis, convenient for users to view data.

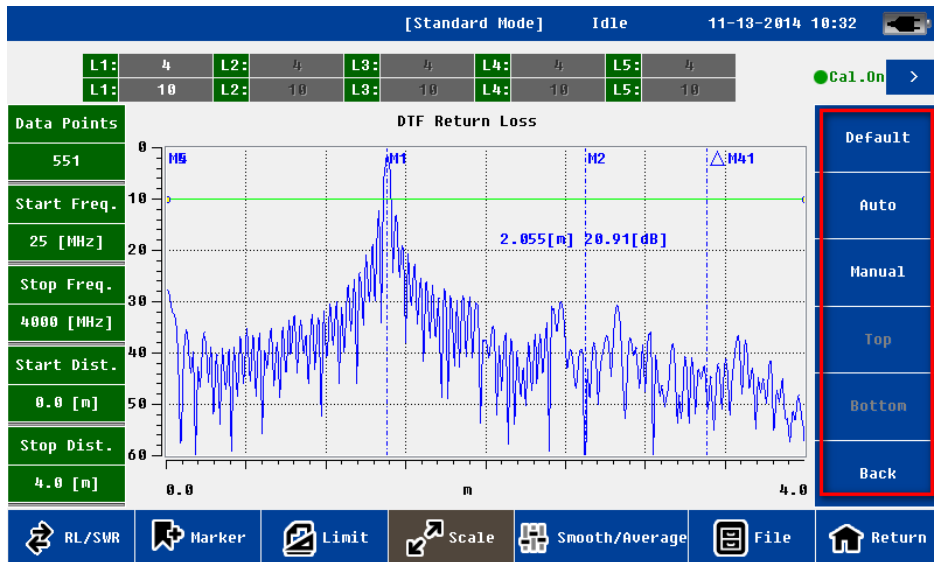


Figure 11.: Scale menu

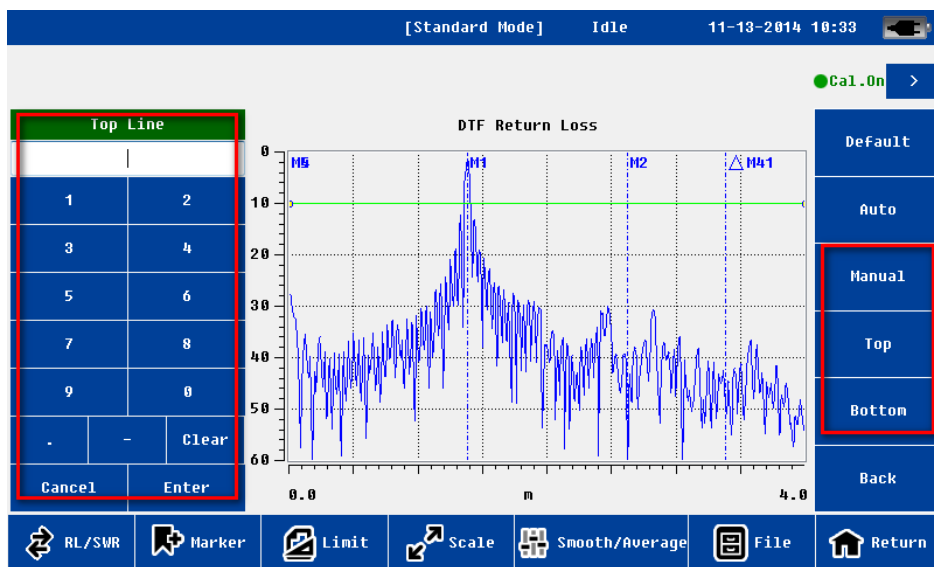


Figure 12.: Manual scale setting menu



Name	Function and Description
Default	Y axis coordinate go back to the default value. Return Loss 0~60. VSWR 1~65. Cable Loss 0~30.
Auto	Adjust Y axis automatically to adapt current measurement data.
Manual	Users can edit upper and lower line of Y axis coordinate manually.

NOTE: The upper and lower coordinate can only be edited if "manual" menu is activated.

3.4.4 File

The user can save measurement data or picture to PC; also can recall measurement data from PC to AC-726. This function facilitate users to analyze the measurement data later.

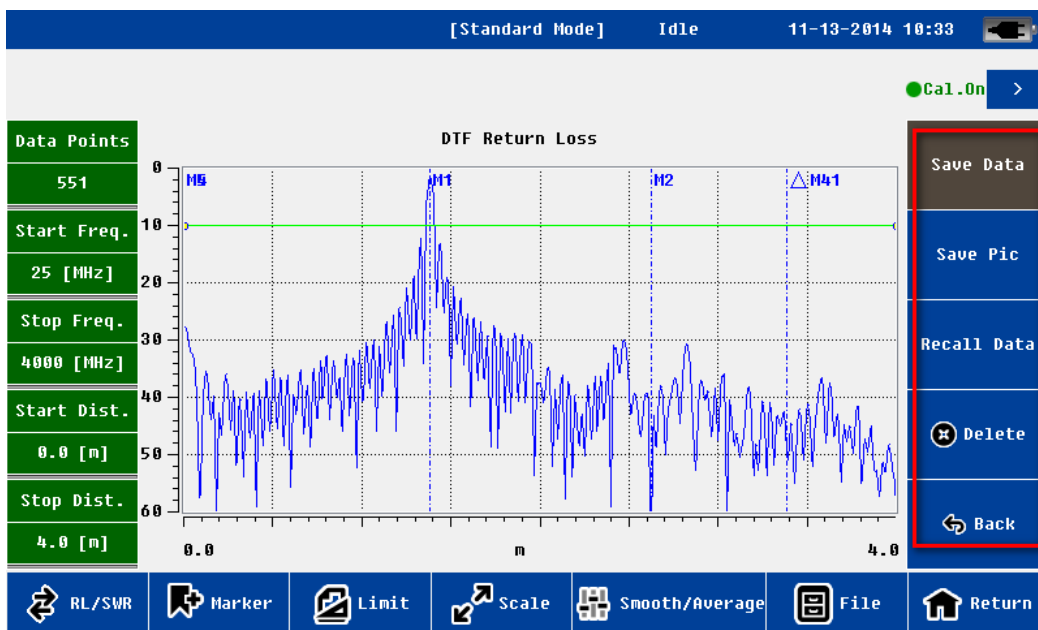


Figure 13.: File menu

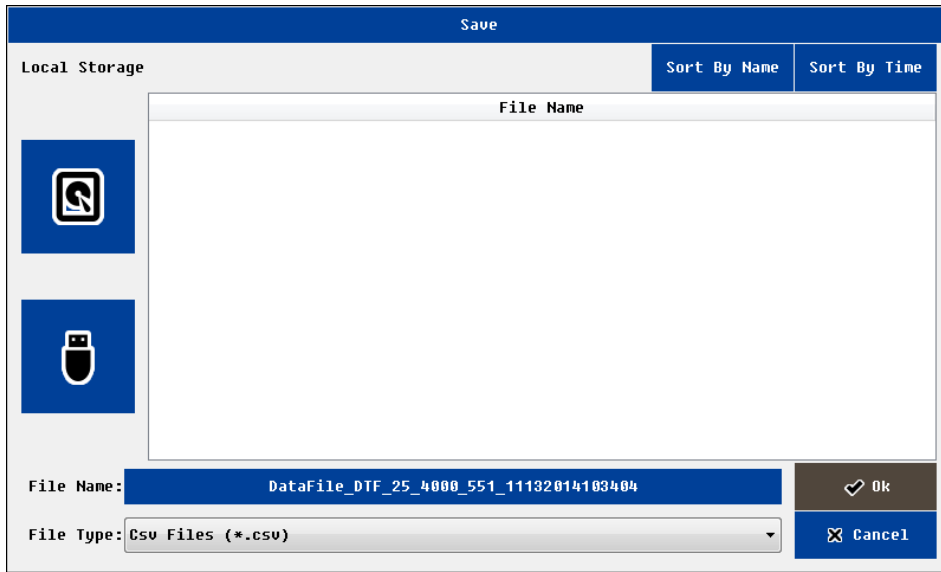


Figure 14.: Save file interface

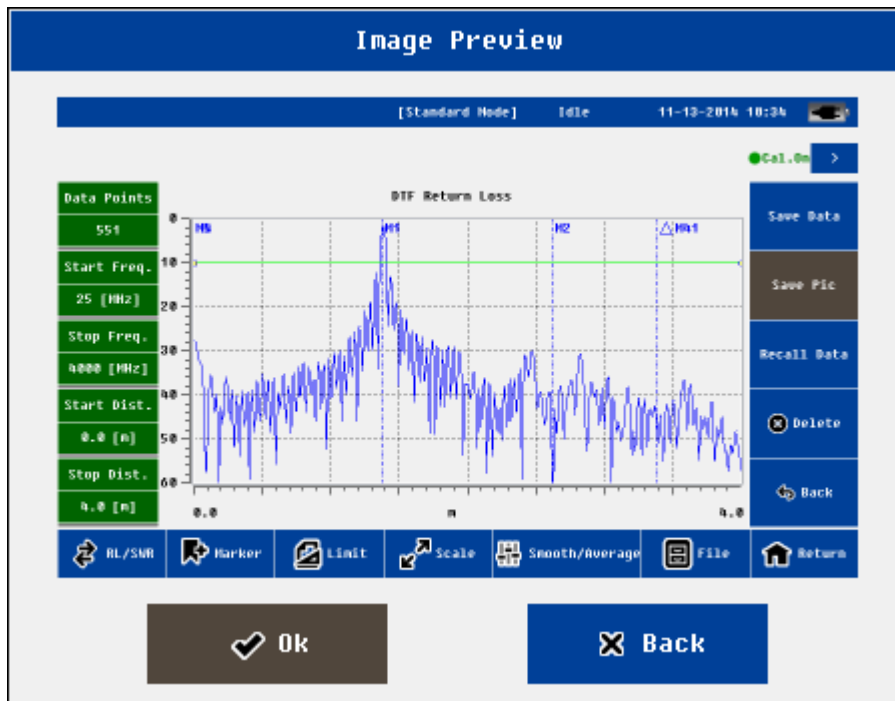


Figure 15.: Image preview interface

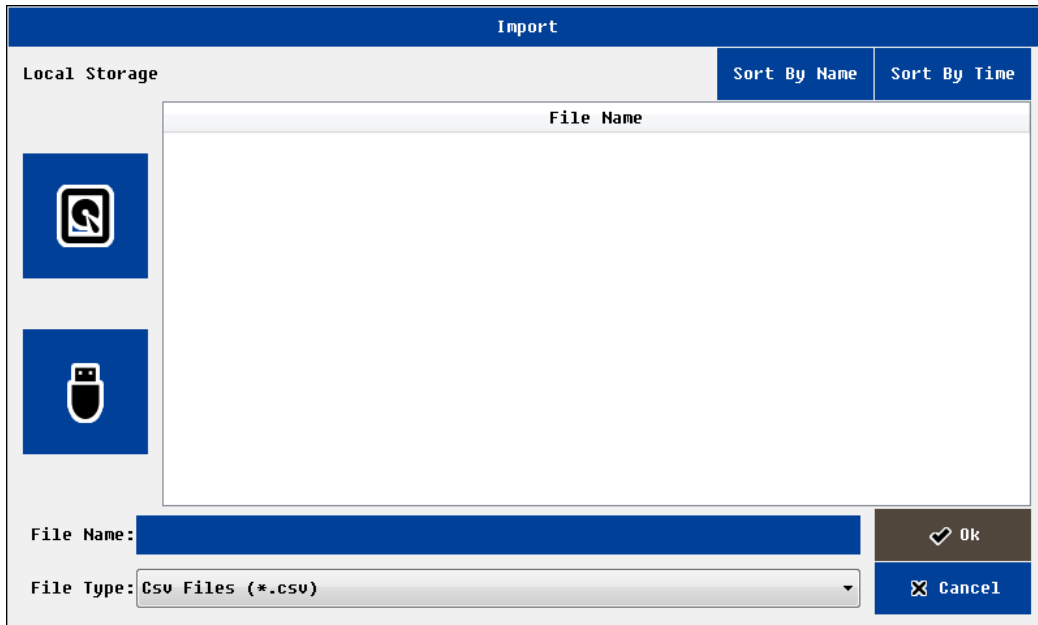


Figure 16.: File import interface

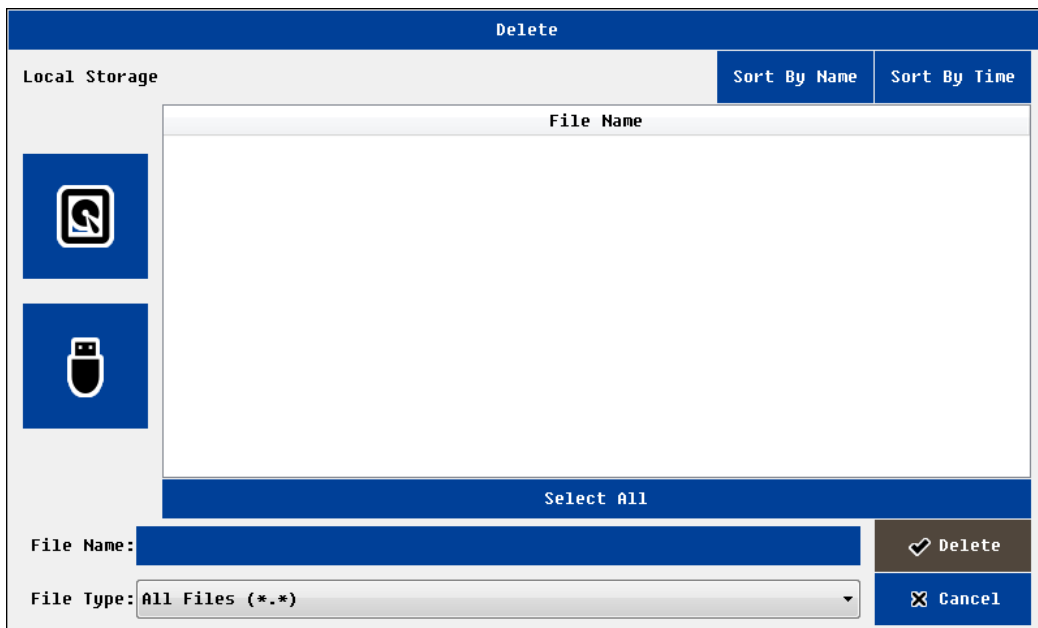


Figure 17.: File delete interface



Name	Function and Description
Save Data	The default file type is .csv format. The default file name includes the measurement mode, frequency, measuring points, the time information. users can choose to save in the local memory or external memory Only support measurement and calibration data.
Save Picture	The default file type is the.JPG format. The default file name includes the measurement mode, frequency, measuring points, the time information. users can choose to save in the local memory or external memory Only support measurement data. Screenshot only support the curve of measurement data.
Recall Data	The target file can be stored in the local memory or external memory. Import file must be.csv type and the format must be correct.
Delete	Delete the files.

NOTE: User must return to the superior interface before removing the external disk.

3.4.5 Display

The display menu is mainly used for data analysis. Users can save current data (either current measurement data or recalled history data) to the memory, then compare the current measured data and memory data.

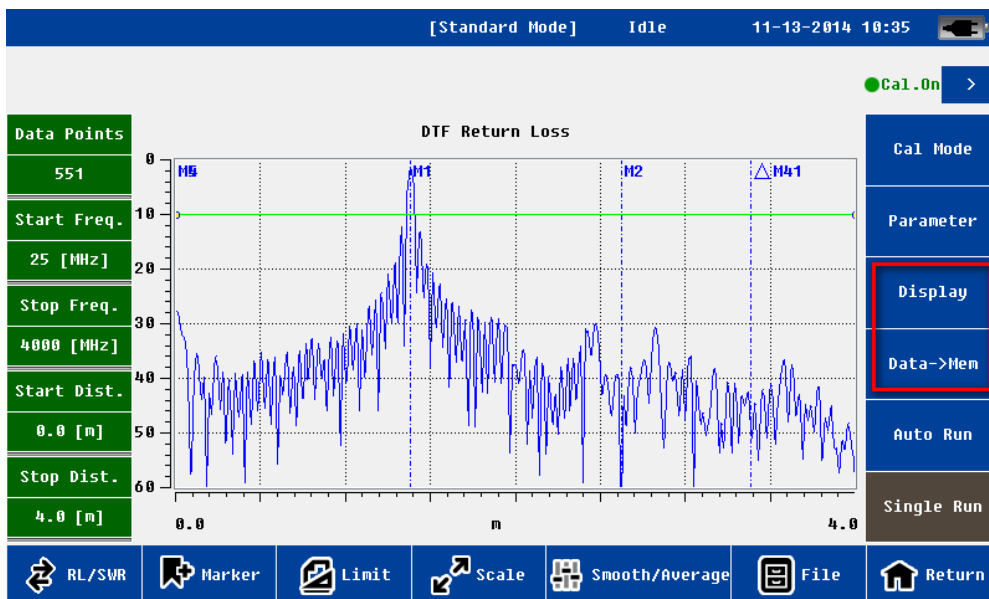


Figure 18.: Display menu

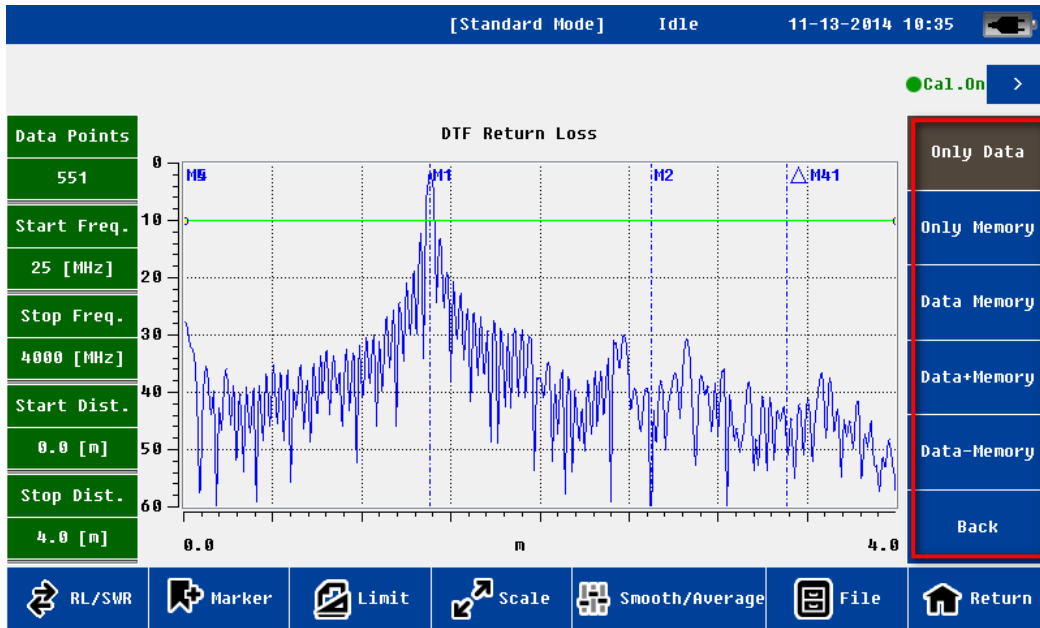


Figure 19.: Display setting menu

Name	Function and Description
Data->Mem	Save current data to memory. Note: Only one data can save. The data can be the current measurement data, can also be a historical data. It can recall from local or external disk.
Only Data	Display the current measurement data.
Only Memory	Display the memory data.
Data & Memory	Display the current measuring data and memory data at the same time. Note: the format of two data must be same , such as the mode of measurement, frequency, measuring points, the distance information etc.
Data + Memory	Display "the current measuring data plus the memory data". Note: the format of two data must be same , such as the mode of measurement, frequency, measuring points, the distance information etc.
Data - Memory	Display "the current measuring data - the memory data". Note: the format of two data must be same , such as the mode of measurement, frequency, measuring points, the distance information etc.



3.4.6 Average/Smooth

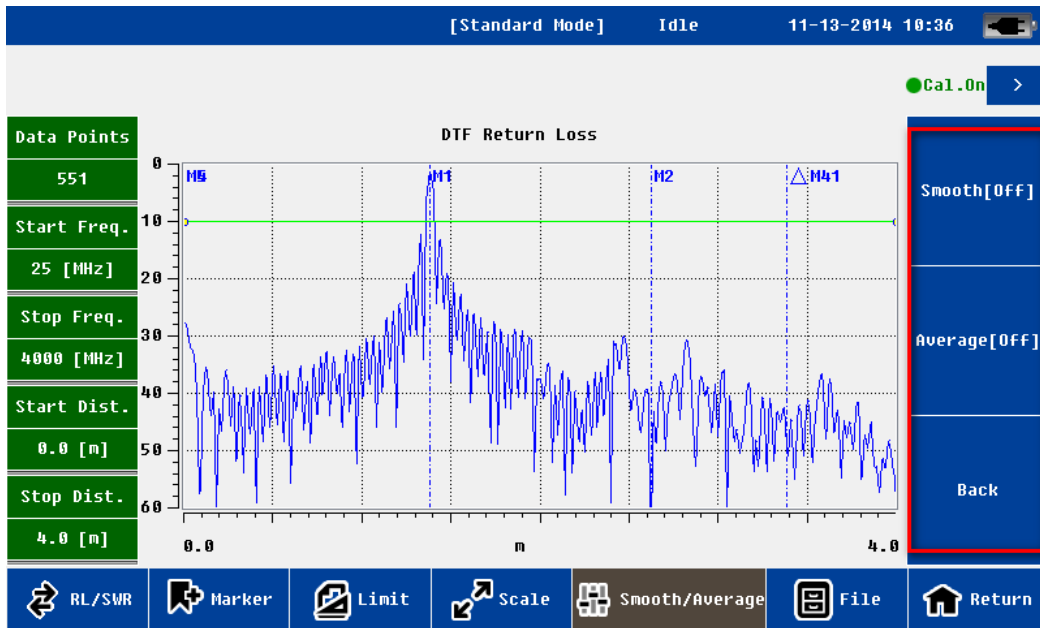


Figure 20.: Average/Smooth menu

Name	Function and description.
Smooth	For a single curve do smooth operation.
Average	For 2 relative curve do average operation.



3.5 Calibration interface

The user need to calibrate before the measurement. This instrument use open short load (OSL) calibration. Users need to follow the instruction and connect open / short/50 Ohm load respectively to the RF port and do calibration.

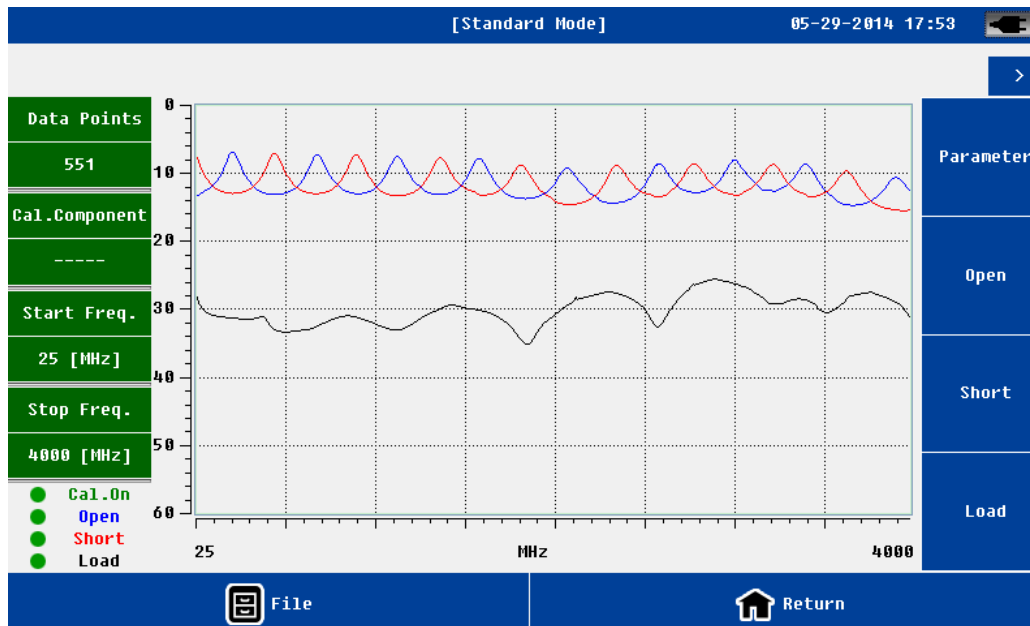


Figure 21.: Calibration interface

The calibration interface is similar to measurement interface. On the left-top of screen including frequency information, On the left-bottom of screen including calibration information.

The user can save current calibration data to the local or external disk, or Import history calibration data to AC-726.

Before calibration, the user need to set the correct parameters, Mainly refer to the frequency and measurement points. The completion calibration, the corresponding curve will display on the screen. If calibration is valid, the status on the left-bottom will become "cal On". If calibration is invalid or unfinished, the status will be "cal off".

After the calibration, the user can return directly to the measurement interface for measurement.

System support different calibration kit only if user know the exact electrical length of open/short load. Users can input this parameters in the e parameter menu.



Is the electrical length of open and short cal kit same?	Is the exact electrical length of open and short cal kit known?	Return Loss/VSWR/cable Loss measurement	Phase/Impedenc-e measurement
yes	unknown	support	do not support
yes	know	support	support
	know	support	support

The return loss of 50 ohms cal kit need to be > 42.

The VSWR of open/short cal kit need to be >100.

If the user does not focus on phase and impedance characteristics, cal kit from other manufacturers can be directly used (usually short and open cal kit have same electrical length).

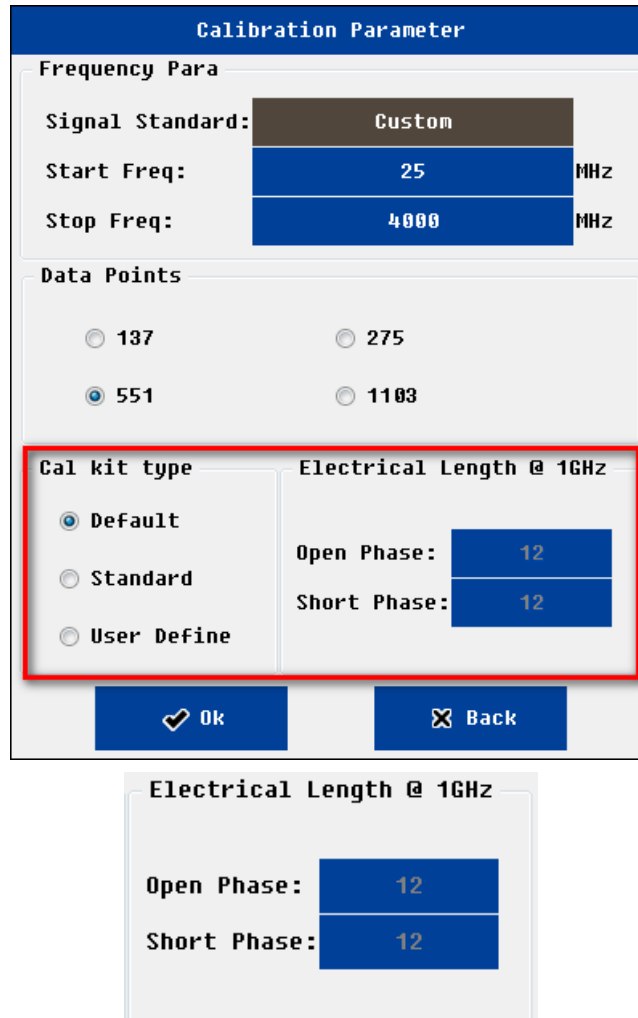


Figure 22.: Calibration setting menu

NOTE: The electric length is measured at 1GHz frequency, the unit is degree.



3.6 System Settings Interface

In the system settings interface, users can do all kinds of system configuration.



Figure 23.: Language setting interface

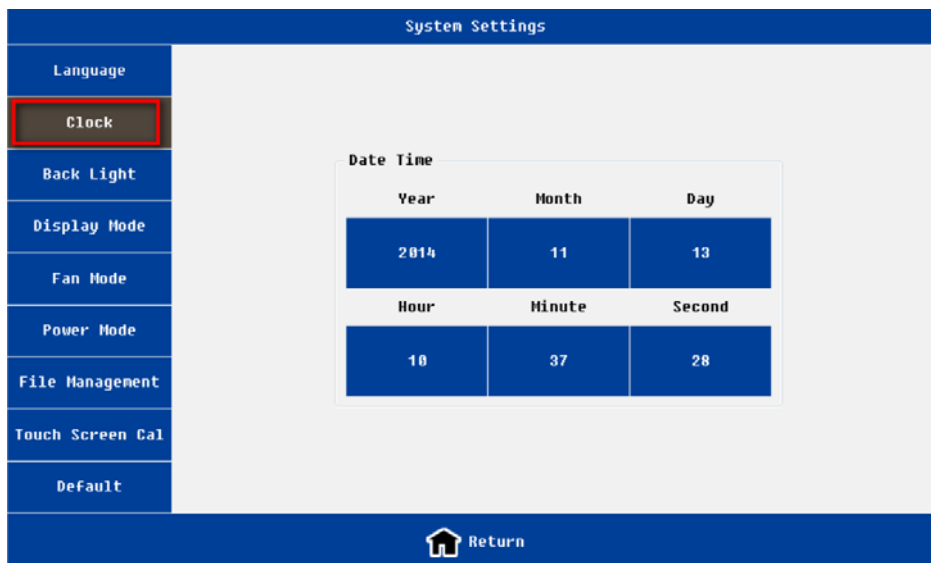


Figure 24.: Clock setting interface

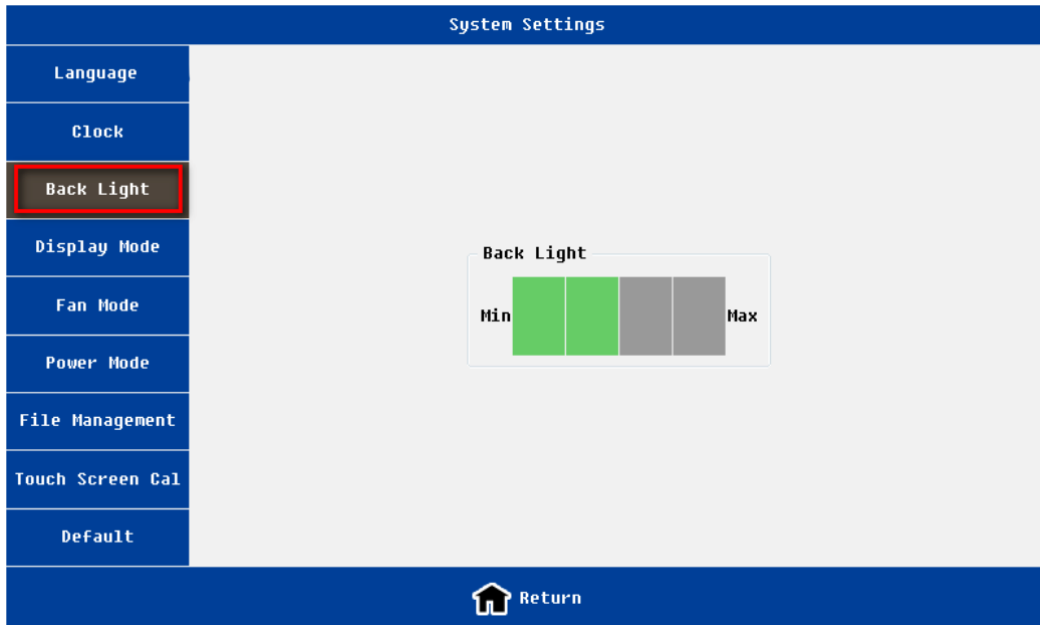


Figure 25.: Back light setting interface

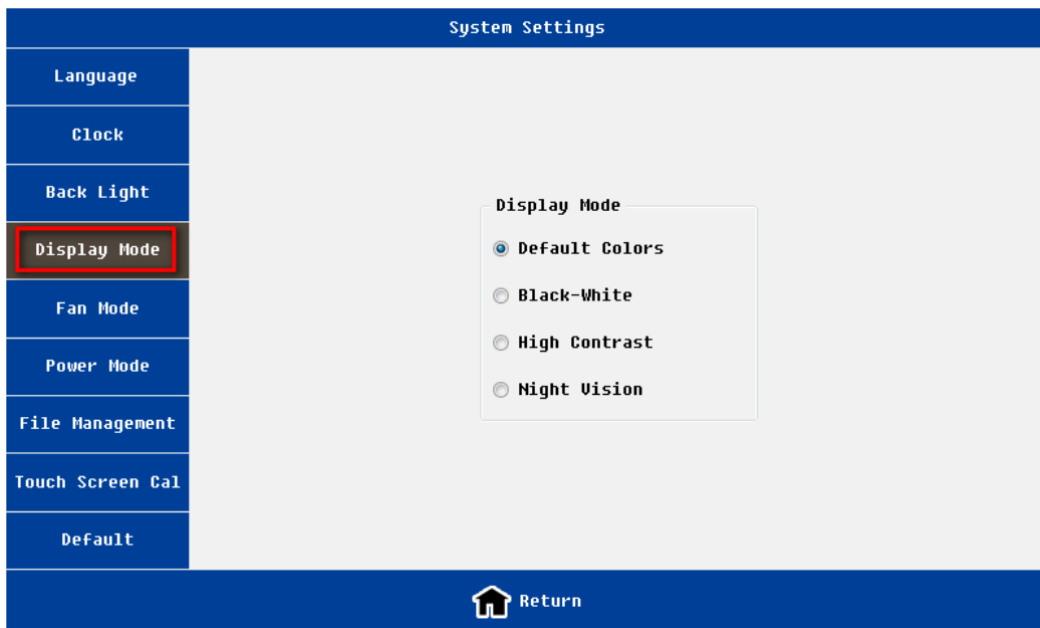


Figure 26.: Display mode setting interface



Figure 27.: Fan mode setting interface

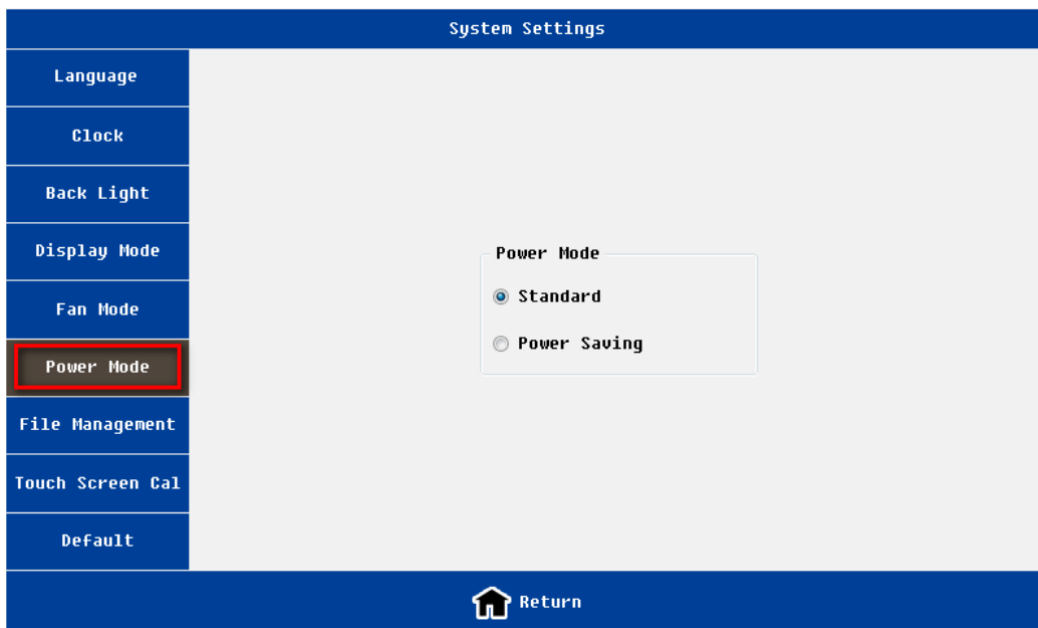


Figure 28.: Power mode setting interface

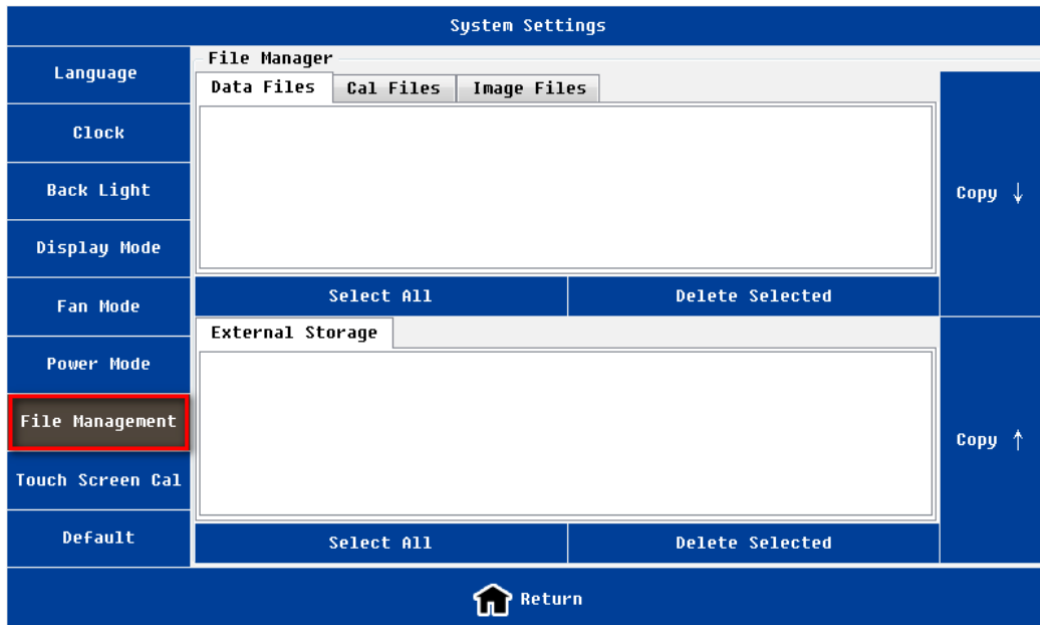


Figure 29.: File manager interface

NOTE: 1. Please make sure that the external memory has been inserted before operating "File Management";
 2. User must return to the superior interface before removing the external disk to make sure files performed.

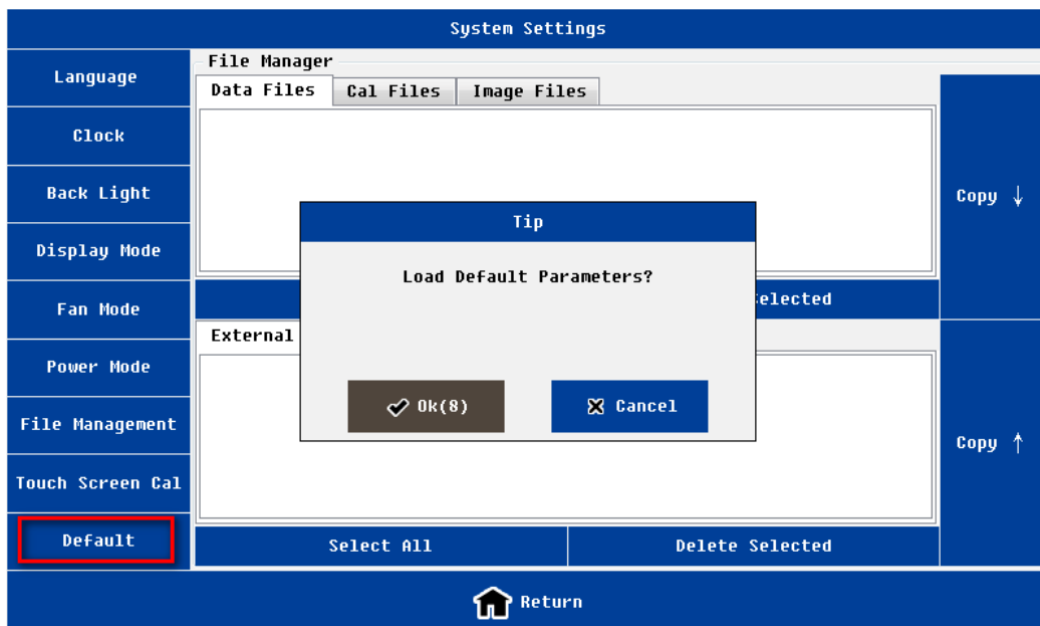


Figure 30.: Load default setting interface



Name	Function and Description
Language	Support English / Spanish
Clock	Year, month, date, hour, minute and second.
Back Light	Support 4 levels brightness adjustment.
Display Mode	4 modes: Default: Black-white: used for printing High-contrast: Night vision: used in night environment
Fan Mode	Three modes: Auto; Always On; Always Off. The default is Auto mode. If temperature higher than 45 degrees, fan is turned on; if below 35 degrees fan is turned off.
Power Mode	Two modes: standard modes (default); power saving mode. If working in the power saving mode, the relative RF circuits will be power on until measurement. It can save power's consumption and protect circuits, but its disadvantage is the measurement time will be a little long.
File management	For file management of both local disk and the external disk. Support file copy and delete functions. Support following file type: measurement data(.csv), measurement image (.Jpg), calibration data (.csv).
Touch screen Cal	To calibrate the touch screen. Users Can exit by pushing any hard key.
Default	Restore to default value.



3.7 Help Interface

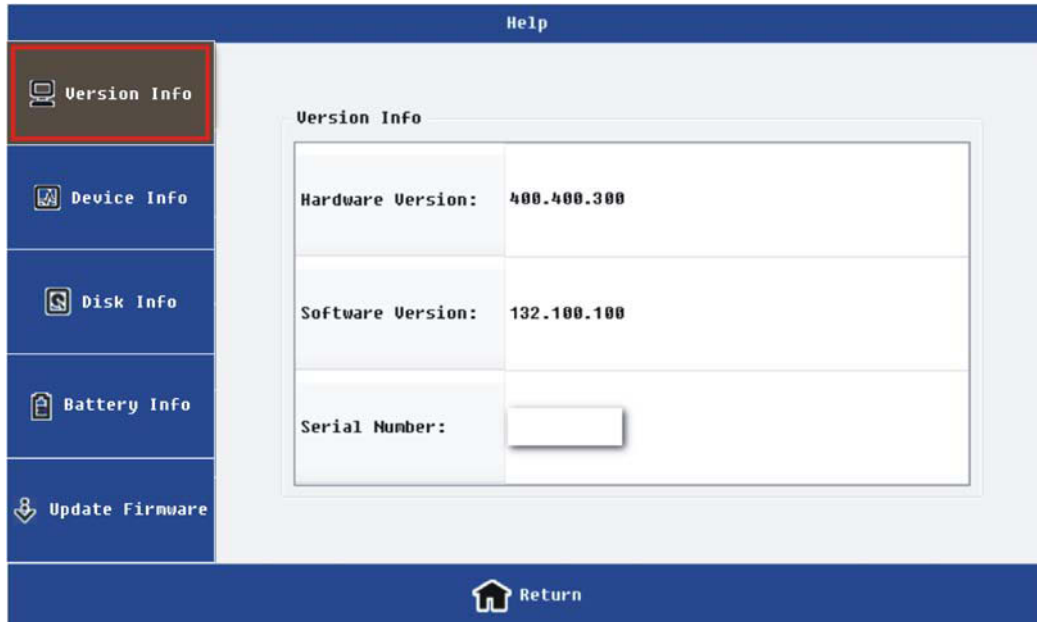


Figure 31.: Version information interface



Figure 32.: Device information interface



Figure 33.: Disk information interface



Figure 34.: Battery information interface

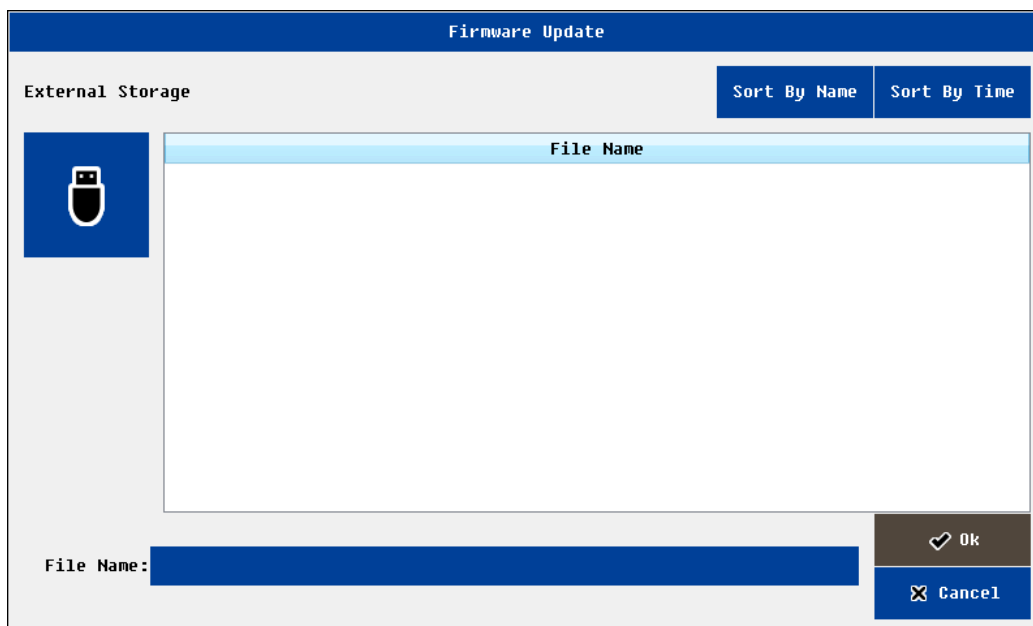


Figure 35: Firmware update interface

On the help menu, the user can view a variety of instruments information; meanwhile users can upgrade the firmware.

Name	Function and Description
Version Info	Incluyes hardware version software version instrument serial number, etc.
Device Info	Includes: board temperature, battery voltage and instrument subsystems statue, etc.
Disk Info	Includes: the information of local disk and a built-in SD card. Note: the local disk refer to flash memory, the different version of the program will have different residual space.
Battery Info	Showing the working status and residual power of the battery and other information.
Update Firmware	The user insert the U-disk to the instrument, select the correct version file; the instrument will automatically upgrade. After the upgrade is complete, the instrument automatically restarts.



4 COMMON OPERATING INSTRUCTIONS

4.1 Set frequency parameter

The user needs to properly set the frequency parameter before testing. In the following ways users can enter the frequency setting interface.

Calibration Parameter	
Frequency Para	
Signal Standard:	Custom
Start Freq:	25 MHz
Stop Freq:	4000 MHz
Data Points	
<input type="radio"/> 137	<input type="radio"/> 275
<input checked="" type="radio"/> 551	<input type="radio"/> 1103
Cal kit type	Electrical Length @ 1GHz
<input checked="" type="radio"/> Default	Open Phase: 12
<input type="radio"/> Standard	Short Phase: 12
<input type="radio"/> User Define	
<input checked="" type="checkbox"/> Ok	<input checked="" type="checkbox"/> Back

Figure 36: Calibration setting interface



DTF Parameter

Start Dist:	0.0	m	
Stop Dist:	4.0	m	Dmax: 20.7 m
Start Freq:	25	MHz	Min Δ F: 55 MHz
Stop Freq:	4000	MHz	Δ D: 0.03 m
Cable Type:	[NONE]		
Prop Vel:	1		
Cable Loss:	0.000		cable Cal

Data Points

137
 275
 551
 1103

Window Function

Rectangular
 Hamming
 Kaiser
 Blackman

Units

Metric
 Inch

Ok Back

Figure 37: DTF setting interface

Freq Parameter

Signal Standard:	Custom	
Start Freq:	25	MHz
Stop Freq:	4000	MHz

Data Points

137 275
 551 1103

Ok Back

Figure 38: Frequency setting interface



- ▶ In the "calibration" interface, click on the "parameter" button
- ▶ In the "frequency return loss" or "frequency VSWR" or "cable loss" measurement interface, click on the "parameter" button
- ▶ The user can also input frequency parameters in "DTF parameter setting" interface

After entering frequency setting interface, the user can set start frequency and stop frequency through the following ways

- ▶ Select pre-defined Signal standard
- ▶ Manual input frequency parameter

Users can click on edit box to edit the parameter of frequency, system will pop up the soft keyboard. The user also can directly press the digital keys of hard keyboard.

The users need to select measurement points. System supports 4 options: 137, 275, 551, 1103.

If the measurement point is set to 1103, compared with the set to 551, it will take about 2 times longer measurement time. And so on.

NOTE: The minimum frequency interval is 1 MHz.
 The start frequency range is 25~3999 MHz; The stop frequency range is 26~4000 MHz.
 The user can modify the pre-defined signal standard through PC software.

4.2 **Set DTF parameter**

The user needs to properly set the DTF parameter before DTF testing. In the following ways users can enter the DTF setting interface.

Enter the "DTF-return loss" or "DTF-VSWR" measurement interface, select "parameter" menu.



DTF Parameter			
Start Dist:	0.0	m	
Stop Dist:	4.0	m	Dmax: 20.7 m
Start Freq:	25	MHz	MinΔF: 55 MHz
Stop Freq:	4000	MHz	ΔD: 0.03 m
Cable Type:	[NONE]		
Prop Vel:	1		
Cable Loss:	0		<input type="button" value="cable Cal"/>
Data Points	Window Function	Units	
<input type="radio"/> 137	<input checked="" type="radio"/> Rectangle	<input checked="" type="radio"/> Metric	
<input type="radio"/> 275	<input type="radio"/> Hamming	<input type="radio"/> Inch	
<input checked="" type="radio"/> 551	<input type="radio"/> Kaiser		
<input type="radio"/> 1103	<input type="radio"/> Blackman		
<input type="button" value="Ok"/>		<input type="button" value="Back"/>	

Figure 39 DTF setting interface

The user can complete the following functions at the DTF parameter setting interface.

- ▶ Enter frequency information and measure points.
- ▶ Enter the distance information.
- ▶ Enter the cable parameters.
- ▶ Select the window function.
- ▶ Set unit (support metric and Imperial).

NOTE: The user can modify the pre-defined cable parameters through PC software.

4.2.1 Set Distance parameter

Distance parameters need to satisfy the testing needs, but also associated with the following parameters

- ▶ The operating frequency range (F1, F2).
- ▶ The number of measured points (N).
- ▶ Cable propagation velocity (Vp).

Once the user set the operating frequency, the number of measured points, cable propagation velocity, the maximum allowed cable length (D_{max}) has be decided.

$$D_{max} = N * 150 * 10^8 * V_p * \frac{1}{F_2 - F_1}$$



For the convenience of users, the system will automatically display the relevant information (the maximum allowed cable length: D_{max} ; resolution ΔD) in the upper right corner.

For example: $N = 551$; $V_p = 0.85$; $F_1 = 25$ MHz, $F_2 = 4000$ MHz. The corresponding D_{max} is 17.64 meters, ΔD is 0.03 meters;

Do not change the frequency, if users want to increase the allowed cable length, can increase the number of measuring points, the corresponding test time can also be longer.

NOTE: Due to the calculation of DTF, the minimum frequency interval is $(N-1) * 100$ kHz. If the measurement points is 551, corresponding minimum frequency interval is 55 MHz.
 The minimum distance interval is 1 meters (inch) or 1 feet (inch).
 Start distance range is: $0 \sim \text{Max}-1$; stop distance range is $1 \sim D_{max}$.

4.2.2 Set Cable parameter

Users can manually input cable parameters (velocity; cable loss) or select the type of cable known.

The propagation velocity of electromagnetic wave in the cable is less than the vacuum speed (300M meters /second). Propagation constant is 0.85, meaning that the actual propagation velocity of the electromagnetic wave in the cable is the $0.85 * 300M$ meters / second.

When the user in the fault distance analysis, often want to know the return loss or VSWR of one exact connector. At that position, the cable loss and connector return loss will be mixed together, systems need to remove cable loss impact in the calculation connector return loss. The unit of cable loss is dB/ meter.

Users can select cable from pre-defined cable list. Usually the cable loss will vary with frequency .System will automatically calculate the cable parameters According to the cable parameters and working frequency.

If the user does not know any cable information and parameters, but have a cable at hand, users can use the system tools ("cable" cal) to get these parameters.

Click on the "cable cal" button in the DTF parameter interface, system will pop up one window. Users enter the measured actual length of cable (0.5~10 m); one end of the cable is connected to the RF port, the other end connected to open load or connected to nothing. Once the calibration is completed, the cable parameters will automatically refresh in DTF parameter interface.

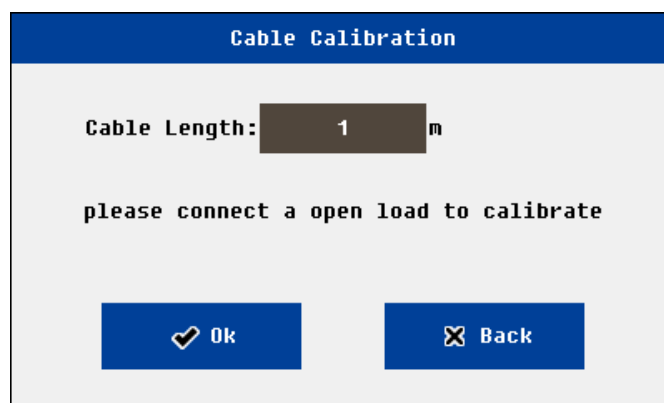


Figure40.

4.2.3 Set Window Function

In the distance to the fault analysis, if the location of the two connectors are close, because of the influence of spectral leakage, two connectors will be influenced each other. If return loss of one connector is much smaller than another one, most probably it will be lost and can't be recognized. In this case users should choose to use the window function.

System support four types window function: rectangle window, Hamming window, Keyser window, Blackman window.

4.3 OSL Calibration

The user needs to confirm the system is in "calibration valid" state before a test. Before one test, system need to know beforehand the 3 known load (open /short/500hm) test results. The user can import the previous calibration data; or do OSL calibration before test.

The user can enter the calibration interface by the following ways.

- ▶ In the main interface, click on "calibration" mode icon.
- ▶ In the measurement of interface, click on the button "cal mode".

The OSL calibration procedure is as follows.

- ▶ Set the frequency parameter.
- ▶ Set up calibration parameters (optional).
- ▶ Calibrate the first load.
 - Connect the load to the RF ports, click on the corresponding button.
 - The system will pop up a small window, click on the "OK".
 - System start calibration.
 - Once calibration is completed the screen will display the curve.
- ▶ Calibrate other loads.
- ▶ If all calibration of three loads completed, the green "cal on" will shown at the lower left corner of the screen.



Users can directly calibrate at the RF port, also can calibrate with a high performance cable connected to RF port. If the former, usually, the calibration curve of 50 ohm load will be significantly lower than the other two.

If calibration is completed, the user can start measurement.

The user can also select the file menu to save the calibration data in the local or external disk.

After the system boot, the default calibration data will be recent one.

The user clicks on the "file" menu, click "import", can recall previous calibration data. If the environment is similar, the previous calibration data can be used directly.

NOTE: Need to re calibration if frequency changed or measurement points increased
 Need to re calibration if temperature changes a lot
 Do not need re calibration if measuring points reduced.
 Do not need re calibration if distance, cable parameters, window function changed.

4.4 **Freq-Return Loss, Freq-VSWR, Cable-Loss measurement**

The measurement can be used to verify the power matching of the port or the loss of the cable .X axis coordinate is frequency, Y axis coordinate are VSWR, or the return loss, or loss of cable separately.

In the following ways users can enter the measurement interface.

In the main interface, click on the "measurement" icon, and then click the corresponding icon.

In the measurement interface, the user can do a variety of measuring operation.

NOTE: Need to set proper frequency parameters before test
 Need to confirm that the system is in "calibration valid" state before test
 The minimum frequency interval is 1MHz



4.5 DTF-VSWR, DTF-Return Loss measurement

The measurement can be used to verify the power matching performance of different position of cable and antenna system, then user know a certain position joint connection quality. X axis coordinate is distance, Y axis coordinate is VSWR, or return loss.

In the following ways users can enter the measurement interface.

In the main interface, click on the "measurement" icon, and then click the corresponding icon.

At the measurement interface, the user can do a variety of measuring operation.

NOTE: Need to set proper frequency, distance, cable parameters and window function before test.
Need to confirm that the system is in "calibration valid" state before test.

The maximum measuring range and accuracy associated with frequency parameters, the propagation velocity of cable.

The minimum frequency interval : $(N-1) * 100$ kHz (N: measurement points).

The user can set the unit in the DTF parameters window units (metric and Imperial).



5 AC-726 PERFORMANCE

Specification	
Frequency Range	25-4000 MHz
Frequency Resolution	100 kHz
Frequency Accuracy	+/-25 ppm
Output signal level	0 dbm (typical)
Measurement speed	3.5 ms / point
Measurement point	137, 251, 551, 1103
Directivity	42 dB (after calibration)
Interference Immunity	On-channel 17 dBm > 1 MHz away from carrier freq. On-frequency -5 dBm, within +/-10 kHz of the carrier freq.
Freq-RL range	0~60 dB
Freq-RL Resolution	0.01 dB
Freq-VSWR range	1~65
Freq-VSWR resolution	0.01
Cable Loss range	0~30 dB
Cable Loss Resolution	0.01 dB
DTF- return loss range	0~60 dB
DTF-VSWR range	1~65 dB
Distance-to-Fault range	1500 meters
Distance-to-Fault Resolution	$1.5 \times 10^8 \times V_p / (F_2 - F_1)$ Vp: velocity propagation constant; F1, F2: start and stop frequency



General Information	
RF Connector	Type N, female
Input impedance	50 Ohm
Display	7 inch resistor touch LCD, 800*480 resolution
Data interface	1 USB Host 1 USB Device 1 10M/100M adaptive LAN
Storage	>2000 curve
Language	Spanish, English
Battery	Type: Li-Ion 11.1 V 7800 mA
External Adaptor	110~240 50~60 Hz AC input, 16 V 3.75 A DC output
Working temperature	-10 °C ~ 50 °C
Storage temperature	-40 °C ~ 70 °C
Humid	0~85% (no condensation)
Weight	2.5 kg (net weight)
Size	290×175×75 mm

*Specifications subject to change without notice.



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