



**ASA5510 CATV
Signal Analyzer**

User Guide

Revision D

ACT ASA 5510 Integrated Digital and Analog Signal Analyzer User Manual

ACT Document Number: ASA 5510 TESTER UG Revision D

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This document is produced to assist professional and properly trained personnel with installation and maintenance issues for the product. The capabilities, system requirements and/or compatibility with third-party products described herein are subject to change without notice.

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Revision History

| Revision | Date | Reason for Change |
|----------|------------|-------------------------|
| A | 08/01/2013 | Initial Release |
| B | 12/22/2014 | Section Updates |
| C | 05/22/2015 | Digital Section Updates |
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Chapter 1. Introduction

ASA5510 Integrated Digital and Analog Signal Analyzer is an all-in-one CATV signal analyzer/tester providing today's engineers a complete portable tool in resolving digital video broadcast, transport, and reception challenges. The 5510 Series is capable of testing and analyzing optical or RF CATV signals, DVB-C HD/SD digital broadcast channels with integrated TV video monitor, and audio amplifiers.

The ASA 5510 provides powerful analog RF and digital (DVB-C) TV analysis including CNR, MER, BER, EVM, power level, noise margin, and constellation diagrams. In SCAN mode, it can scan all RF channels and store signal levels. In spectrum mode, it can carry out a spectrum display and test for a certain frequency range. It provides a full range of unique special tests and video monitoring features to assist field technicians in maintaining and troubleshooting all cable and TV transport and reception systems. The user interface has easy-to-use touch buttons and displays measured values and TV images at the same time.

ASA5510 Integrated Digital and Analog Signal Analyzer can be used in a variety of analog and digital signal detection and measurement and is a compact and effective tool for network construction, maintenance, and acceptance. The signal analyzer is packaged in a robust waterproof travel case with built-in battery.

Key Features:

- Compact all-in-one CATV signal analyzer/tester
- Displays measured values and TV images at the same time
- Supports analog TV signal parameter measurements
- Supports DVB-C digital signal features: average peak power, MER, BER, C/N, EVM, constellation diagram
- Can measure DVB-C digital signal features: average peak power, MER, BER, C/N, EVM, constellation diagram
- Built-in audio amplifiers, left and right channels
- Built-in lithium battery
- Conditional access Verimatrix smart card slot
- Supports both at channel and frequency modes
- Scan all channels and store signal levels
- Carry out spectrum display and test for a certain frequency range
- Can measure CATV TILT, C/N, trunk cable voltage, etc.

- LCD displays all testing results as well as CATV images
- Waterproof travelling casing design

1.1 Specifications

Frequency

| | |
|----------------------|---------------------------------|
| Frequency Range | 5 ~ 1000 MHz |
| Frequency Accuracy | ± 50 ppm (@ 20°C \pm 5°C) |
| Frequency Resolution | 10 kHz |

Channel Type

| | |
|------------|---|
| Analog TV | PAL / NTSC |
| Digital TV | QAM 16/32/64/128/256 with constellation diagram plus QPSK and COFDM |
| FM Radio | Single frequency |

Digital Channel

| | |
|------------------------------|--|
| Demodulation Type | Standard ITU-T J.83 Annex A/B/C |
| Support | QAM 16/32/64/128/256 |
| Symbol Rate | 1 MS/sec to 7 MS/sec |
| Bandwidth | 280 kHz to 10 MHz |
| MER (Modulation Error Ratio) | 39 dB (QAM) |
| Accuracy | ± 2.0 dB |
| BER (Bit Error Rate) | $1E^{-3}$ to $1E^{-8}$ before and after R-S decoding (QAM) |
| Power Measurement Type | QAM, QPSK, and COFDM |

Digital Channel Average Power

| | |
|-------------|---------------------|
| Level Range | 30 ~ 120 dB μ V |
|-------------|---------------------|

Constellation

| | |
|--------------|--|
| Accuracy | ± 2.0 dB from 10°C to 30°C and ± 3.0 dB from -10°C to 40°C |
| Resolution | 0.1 dB |
| Display Mode | QAM 64 and QAM 256 with zoom in and zoom out capability |

Analog Level Measurement

| | |
|-----------------|----------------------------------|
| Range | 30 ~ 120 dB μ V |
| Accuracy | ± 1.5 dB |
| Resolution | 0.1 dB |
| Input impedance | 75 Ω ("F" type connector) |

HUM Modulation

| | |
|-------|--------|
| Range | 2 ~ 5% |
|-------|--------|

Channel Scan

| | |
|--------------------|-----------------------|
| Number of Channels | 160 channels max |
| Scanning Speed | 5 channels per second |

| | |
|--|--|
| Scale | 1, 2, 5, 10 dB/div |
| Zoom | 1×, 2×, 3×, 4×, 5× five levels of magnification or full channel scan |
| Frequency Spectrum | |
| Bandwidth | 2.5 MHz, 6.25 MHz, 12.5 MHz, 25 MHz, 62.5 MHz, and full span |
| Scale | 1 dB, 2 dB, 5 dB and 10 dB/div |
| Tilt Measurement | |
| Number of Frequencies | Maximum 12 with 0.1 dB of resolution |
| Limit Test Parameters | |
| Minimum/Maximum Video Level | 60 ~ 90 dBμV |
| Minimum/Maximum Δ V/A | 10 ~ 20 dB |
| Minimum/Maximum Power Level | 70 ~ 90 dBμV |
| Minimum MER | 33 dB (varies with modulations and systems) |
| Max PRE/POST BER | 1.0 E ⁻⁹ |
| Auto-Test | |
| Number of Programs | Maximum 7 test parameters |
| Line Voltage Measurement | |
| Range | 0 V to 100 V (AC/DC) with accuracy of ±2 V |
| RF Signal Optical Input Measurement | |
| Wavelength | 1200~1600nm, calibrated for 1550nm |
| Optical Input Power | -14 to +3dBm (AGC: -8 to 0dBm) |
| Optical Display Resolution | 0.1 dB |
| Optical Measurement Accuracy | 0.5 dB |
| Optical Return Loss | -55 dB |
| Output Level | 80 dBuV @ (-8 ~ 0dBm) |
| RF Flatness | +/-1 dB |
| RF Return Loss | >=14 dB |
| Interface/Connectors | |
| Optical Input Connector | SC/APC |
| Optical Connector for GPON | SC/APC |
| RF in Connector | F Connector |
| Carrier/Noise | |
| Level Range | 80 dBμV ~ 105 dBμV |
| C/R Range | 30 dB ~ 50 dB |
| Storage | |
| Memory | 512K byte |
| Accessories | |
| Suitcase | Portable meter case with protection |
| Battery Charger | Integrated Battery charger |
| RF Input/output Port | F Type (2) |
| Optical Attenuator | 2 |

| | |
|------------------|-------------------------|
| RF Jumper | 1 |
| Optical Jumper | 1 (SC/APC ~ SC/APC, 2m) |
| RF Jumper | 1 |
| RF Connector | 2 |
| Operation Manual | Included |

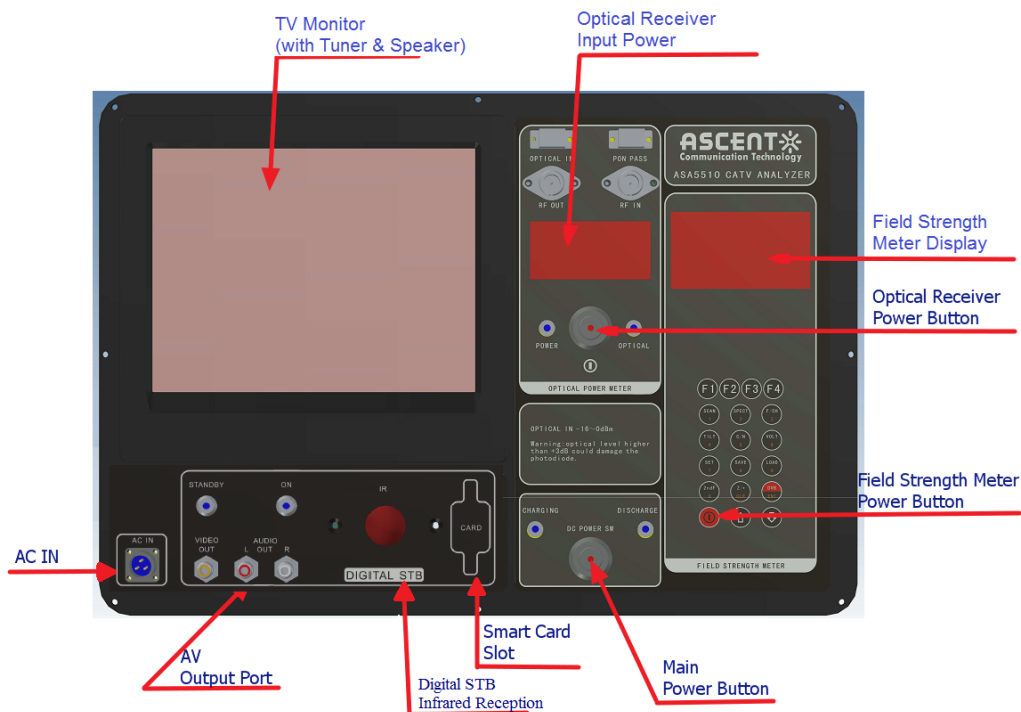
Environment

| | |
|---------------------|--|
| Dimensions (L×W×D) | 415mm × 320mm × 170mm |
| Weight | 7.2 kg |
| Working Temperature | -10 ~ +40°C |
| Display LCD | 7" 128×64 Matrix LCD with back light |
| Display Analog TV | Supported with integrated tuner |
| Display Digital TV | Supported with optional integrated STB |

Power

| | |
|-----------------------|------------------------------------|
| DC Supply | DC 7.2V/1.6Ah rechargeable battery |
| AC Supply | AC 240V/50Hz ±10% |
| Battery Working Hours | 2 hours at continuous working mode |
| Battery Type | Lithium ion or lithium polymer |
| Battery Capacity | 1.6 AH |
| Battery Charger | 12V DC max 7A |
| Recharging Time | 8 ~ 10 hours |

1.2 Front Panel Appearance



1.3 Channel Measurements

ASA5510 supports accurate signal level tests in analogue TV, QAM, and single frequency modes.

For analog channels, you can get video level, audio level, $\Delta V/A$, etc.

For digital channels, ASA5510 supports QAM, QPSK, and COFDM modulation modes. Channel Power, MER, and BER are available here.

NOTE: MER and BER tests are only in QAM Modulation Mode. (16/32/64/128/256QAM)

1.4 Constellation Diagram

For Digital channels, the constellation diagram function supports QAM modulation modes. Channel Power, MER, BER, and Constellation Diagram are available here.

1.5 BER Statistics

For digital channels, you can get MER, BER, ES, SES, COR, UNCOR, etc...

1.6 Tilt/Level List

The tilt/level list test is an effective solution to check flatness and amplitude. ASA5510 supports 12 channels tilt max.

1.7 Channel Scanning

ASA5510 supports video and audio level display of all channels, up to 160 channels. Its 5 levels of zoom in/out and marker function make your observations easier.

1.8 Spectrum Scanning

ASA5510 has a spectrum function. It provides several spans and two sample modes (AVG and PEAK). In order to detect and find the interference, it has a peak-hold function which shows the difference between peak spectrum and current spectrum using the marker and double-marker function.

1.9 Hum Measurement

HUM is also known as power supply hum modulation distortion, which comes from the low-frequency interference of the power supply.

1.10 Limit Measurement

ASA5510 can quickly check the cable system using the limit test function. Each enabled channel will be tested according to limits set by the user, and a pass/fail indicator can be viewed after testing.

1.11 Return Path

ASA5510 has a Return-Path function, please refer to section 1.8.

1.12 Auto Test

ASA5510 provides a convenient way to automatically test the cable system. You can set up test items including level, spectrum, limit test, HUM, tilt, etc. Test results will be saved automatically.

1.13 Voltage Measurement

ASA5510 can measure battery voltage, trunk voltage, and automatically identify AC or DC cable systems.

1.14 Multiple User Channel

ASA5510 can create up to five user channel plans, which contain digital channels, analog channels, or mixed channels. They can be switched easily, making it suitable for multi-network maintenance.

1.15 File Management

ASA5510 can store the results of channel level tests, QAM tests, tilt tests, channel scanning, spectrum scanning, and HUM tests for an analogue TV channel. Users can manage and analyze these files via meter or PC.

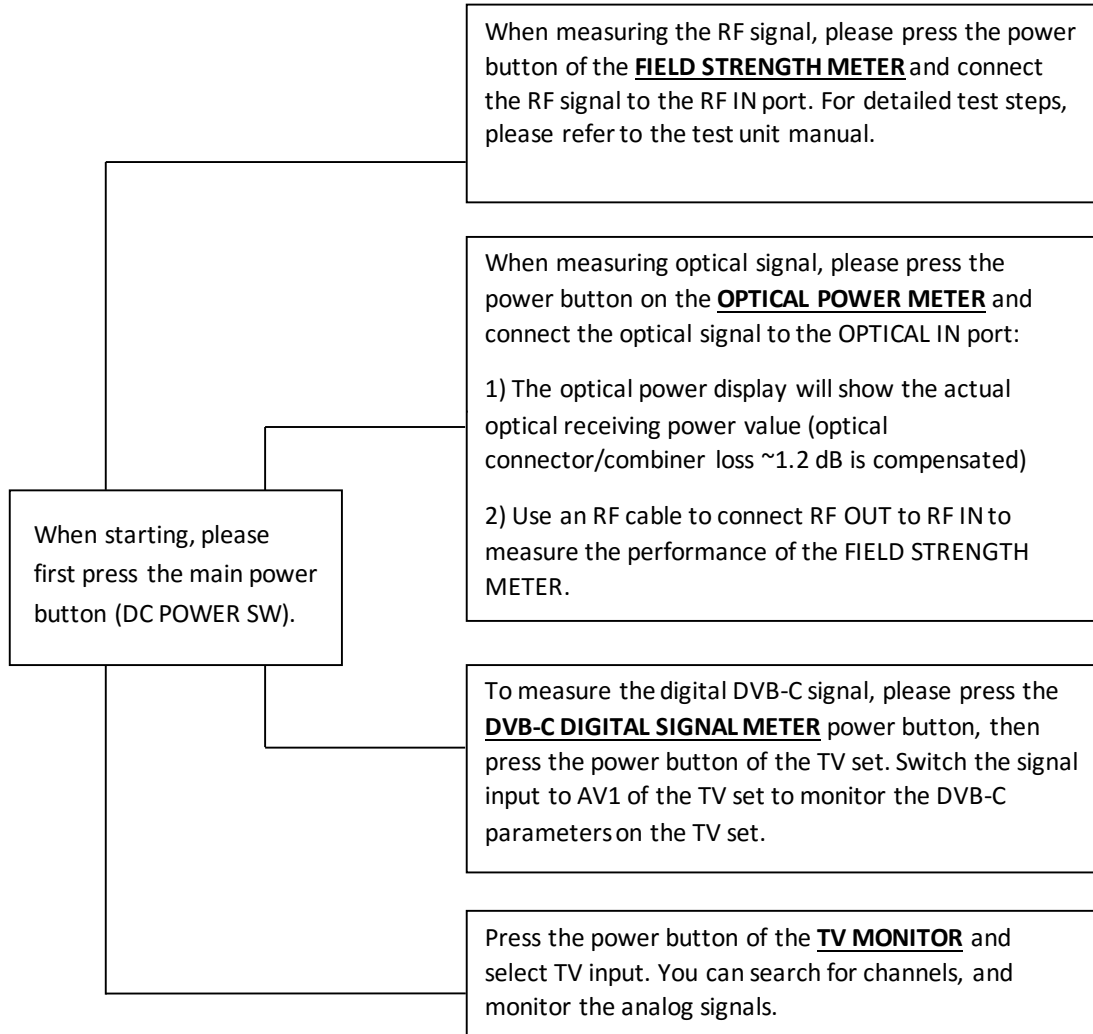
1.16 Intelligent Power Management

ASA5510 with full charge is able to work for over 5 hours. The power supply monitoring system will monitor the power status and ensure the instrument goes into power saving mode.

| |
|--|
| NOTE: Charge the battery before first use. Refer to section 4.2 |
|--|

1.17 Multi-Function Selection




- FIELD STRENGTH METER
- OPTICAL POWER METER
- DVB-C DIGITAL SIGNAL METER
- TV MONITOR






1.17.1 Soft Keys

There are three soft keys (F_1 , F_2 and F_3) located under the screen. They are used to access the functions represented by the icons displayed on the bottom of screen.

1.17.2 Shortcut Keys

There are three keys below the three soft keys including , , and .

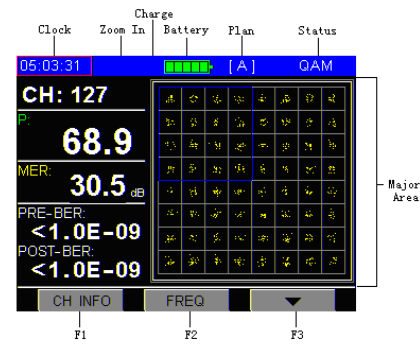
Pressing the  key returns to the menu screen.

The  and  keys are used as different functions in different screens.

1.17.3 Character/Digit Input

Press any character/digit key circularly to input.

1.18 Field Strength Meter Display Description



Chapter 2. Using the Field Strength Meter

2.1 Function Menu Display



Figure 2-1-1

Figure 2-1-1 displays the Main Menu which include all of the function icons.


Soft Keys:


: Enter the selected shortcut interface.

: Switch the selected shortcut on the left direction circularly.

: Switch the selected shortcut on the right direction circularly.

Function keys:

: Switch the selected shortcut on the up direction circularly.

: Switch the selected shortcut on the down direction circularly.

The selected shortcut will be highlighted.

2.2 Learn User Channel Plan

In order to enhance your work efficiency, please create a user channel plan before measurements. ASA5510 will choose all effective channels in the cable system automatically and save them in this channel plan.

The User Channel Plan includes three elements as follows:

- Channel number
- Channel format (TV, DIGI)
- Carrier frequencies (video and audio)

The following are the steps to set up a user channel plan.



1. Connect the instrument with the cable system.
2. Press  to return to the main menu, and select the **SETUP** shortcut as shown in figure 2-2-1, then press  to enter the Setup Menu.



Figure 2-2-1

- Press  or  to select the **CHANNEL PLAN** item, as shown in figure 2-2-2.



Figure 2-2-2

- Now press  on the figure 2-2-3 **CHANNEL PLAN** menu, and then press  to select the user channel plan.

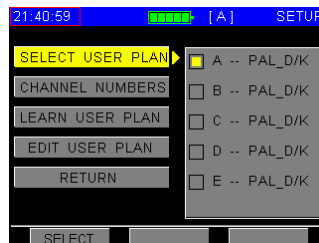


Figure 2-2-3




3. Press  or  to select the **LEARN CHANNEL PLAN** item, and press  to display the LEARN CHANNEL PLAN function as shown in figure 2-2-4.



Figure 2-2-4

Press **F₁** to select a channel type.

4. Press **F₂** or **F₃** to enter a parameter setting, you can define the channel plan as an analog channel plan, digital channel plan, or analog/digital mixed channel plan. You can also edit “Bandwidth, Modulation type, Symbol Rate” in a digital channel plan. When your setup is completed, please press **F₂** or **F₃** to START, then press **F₁** to create your user channel plan. For a while, new user plans will be saved automatically.

NOTE: Analog channels with levels higher than 45 dBμV and digital channels with power levels higher than 32 dBμV will be enabled in a standard channel plan. Only the enabled channels will be displayed in each measurement interface. After setting up your user channel plan, you can enable or disable channels.

When the device is learning the channel plan, please keep the power on and don't interrupt the process, otherwise it will create a wrong channel plan.

2.3 Level Measurement

Press **HOME** return to main menu, press the **F₂** or **F₃** to select the **LEVEL** shortcut as shown in figure 2-3-1, then press **F₁**.



Figure 2-3-1

If there is no valid channel to test, the screen will display the screen shown in figure 2-3-2. If you want to do a test in this function, you have to create a valid channel by pressing **F₁**.



Figure 2-3-2

The channel list will display as shown in figure 2-3-3. Press **F2** or **F3** to select the channel, and then press **↑** or **↓** to scroll up and down the channel list. Press **F1** into the channel information as shown in figure 2-3-4.



Figure 2-3-3

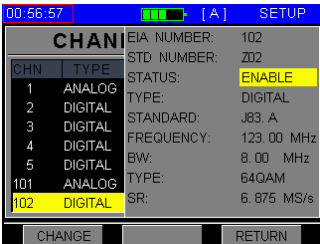



Figure 2-3-4

Press **F2** or **F3** to select the channel parameters. If the selected parameter can be changed, press **F1** to change it. The channels status will be visible as shown in figure 2-3-4.

2.3.1 Analog Channel Measurement

If the current channel is a valid analog channel, The level function will be displayed as in figure 2-3-5. Three test results are displayed in the screen: video, audio, and V/A.

 : Video Level

 : Audio Level

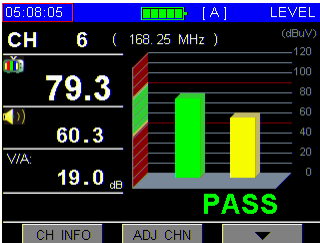


Figure 2-3-5

CH INFO (**F1**): Press this button to display the channel information of this analog channel as shown in figure 2-3-6. The channel parameters can be modified in this screen.

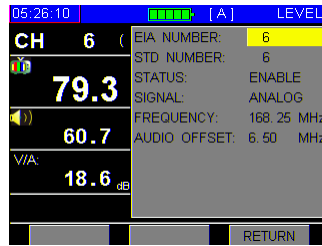


Figure 2-3-6

ONE CHN/ADJ CHN (F_2): The user can switch between two display modes (one channel and three channels):

One channel mode: The histogram shows the video and audio of the current channel only.

Three channels mode: The histogram shows the video and audio of the current channel as well as the levels of two adjacent channels in gray, if the adjacent channels are valid. Refer to figure 2-3-7.

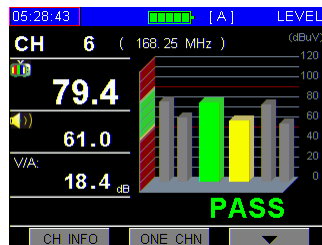


Figure 2-3-7

F_3 : Press this button to enter the next page as shown in figure 2-3-8. The user can press this button again to return.

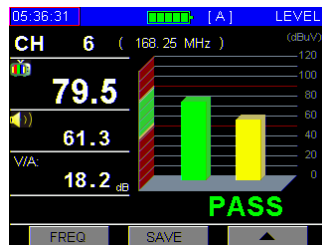


Figure 2-3-8

F_1 and F_2 is used to switch channels circularly. If the next channel is a digital channel, the screen will be changed (refer to next section).

SAVE (F_2): Press this button to save the results of the level test, refer to section 2.13.2 for details.

FREQ (F_1): Press this button to show the single frequency measurement interface shown in figure 2-3-9. Users can modify the frequency. Press this button again to return.

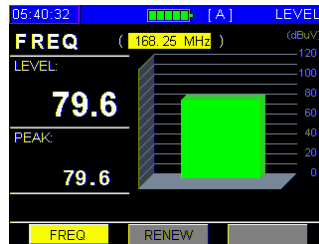


Figure 2-3-9

RENEW: Press this button to test again.

2.3.2 Digital Channel Measurement

Using this function ASA5510 is able to measure POWER, MER, and BER, as seen in figure 2-3-10.

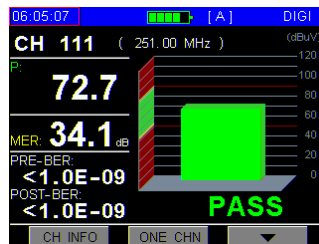


Figure 2-3-10

CH INFO (F1): Pressing this button will display the channel information of this digital channel, as shown in figure 2-3-11. The channel parameters can also be modified in this screen.

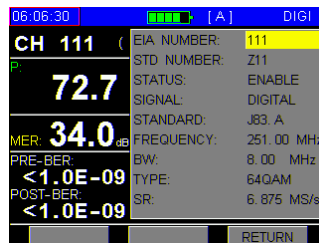


Figure 2-3-11

ONE CHN/ADJ CHN (F2): The user can switch between two display modes (one channel and three channels):

One channel mode: The histogram shows the video and audio of current channel only.

Three channels mode: The histogram shows the video and audio of current channel, and also show the level of two adjacent channels in gray, if the adjacent channels are valid. Refer to figure 2-3-12.

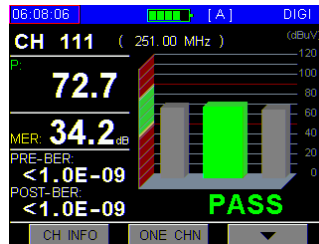



Figure 2-3-12

 (**F₃**): Press this button to advance to the next page as seen in figure 2-3-13. Press this button again to return.

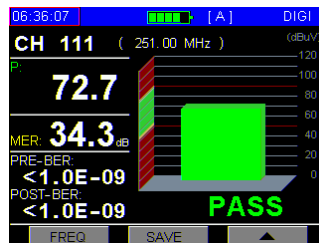




Figure 2-3-13

 and  are used for switching channels circularly. If the next channel is an analog channel, the screen will be displayed as in figure 2-3-5.

SAVE (**F₂**): Press this button to save the results of the level test, refer to section 2.13.2 for details.

FREQ (**F₁**): Press this button to enter the frequency measurement interface as shown in figure 2-3-14. In this mode, the user can easily modify the central frequency, but other digital channel parameters will be the same as channel mode. Press this button again to return.

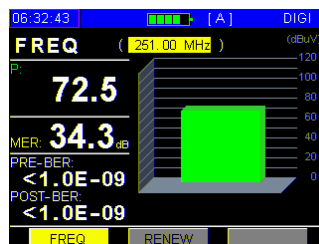


Figure 2-3-14





RENEW: Press this button to test again.


2.3.3 Limit Display

A **PASS** or **FAIL** in big font is displayed on the screen to indicate the quality of the current channel as shown in figures 2-3-5 and 2-3-10. The limit value to judge the quality of a channel can be shown in the measurement setup menu, and can also be modified.

The judge of channel quality can be disabled in the measurement setup menu.

2.4 Constellation Diagram

Press  to return to the main menu interface and press  or  to choose the constellation icon, and then press  to enter constellation measurements.

ASA5510's constellation diagram function supports QAM modes. Here, you can get channel POWER, MER, BER (pre-BER and post-BER), and constellation diagram. All channel parameters can be modified by pressing . Constellation diagrams are shown as in figure 2-4-1.

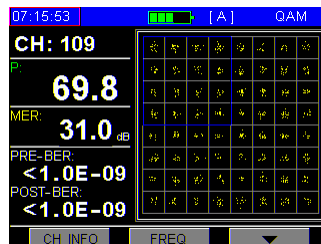




Figure 2-4-1

Soft Keys Operation:

CH INFO (): Press this button to display the current channel information. Users can modify all of the parameters in this menu.

FREQ (): Press this button to display the current frequency POWER, MER, BER (pre-BER and post-BER) and constellation diagram as in figure 2-4-2. Press this button again to return.

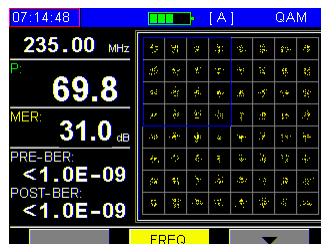




Figure 2-4-2

 (): Press this button to enter the next page as shown in figure 2-4-3. Press this button again to return.

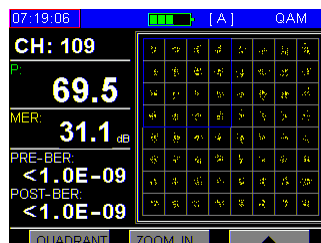


Figure 2-4-3

QUADRANT (F_1): Press this button to switch the selected quadrant in a clockwise direction.

ZOOM IN/ZOOM OUT (F_2): Press this button to toggle the constellation diagram display between zoom in and normal mode. Pressing the zoom in key again zooms in on the selected quadrant and displays the zoom in flag at the top of the screen as in figure 2-4-4.

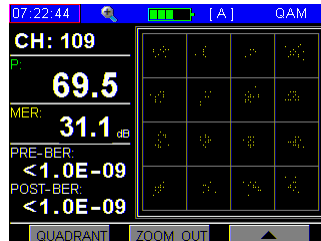


Figure 2-4-4

\leftarrow and \rightarrow are used to switch digital channels circularly.

Note: This function only supports digital channels, if the current user plan doesn't have any digital channels, the screen will show as figure 2-4-5.



Figure 2-4-5

2.5 BER Statistics Measurement

Press \leftarrow to return to the main menu interface, and press F_2 or F_3 to choose the statistics icon, and then press F_1 to enter statistics measurements.

ASA5510 is able to make BER statistics during a set time. Users can retrieve MER, BER, ES, SES, COR, UNCOR, SUM bits and TOTAL BER as shown in figure 2-5-1.

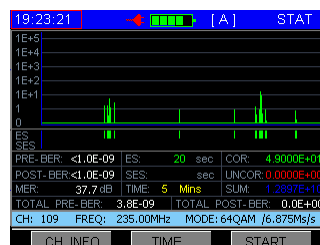


Figure 2-5-1

2.5.1 Parameter Description

| Abbreviation | Meaning |
|----------------|---|
| ES | Error seconds During 1s, there are one or more mistakes which can be corrected or not be corrected, and then ES plus1 |
| SES | Serious error seconds During 1s, if the result of the number of errors that cannot be correct divided by the total bits $> 1.1E^{-3}$, SES plus1 |
| COR | Corrected error bits |
| UNCOR | Uncorrected error bits |
| SUM | Total bits |
| TOTAL PRE-BER | (COR+UNCOR)/SUM |
| TOTAL POST-BER | UNCOR/SUM |

2.5.2 Soft Keys Operations

CH INFO (F_1): Press this button to check the current channel information. Users can modify all of the parameters in this menu.

TIME (F_2): Press this button to set the statistics time, ASA5510 supports several fixed times (5 minutes, 15 minutes, 30 minutes, 60 minutes, 2 hours, 6 hours, 12 hours, 24 hours, and 48 hours).

START/STOP (F_3): Pressing this button will start or stop the statistics process and the screen will display as in figure 2-5-2. Now any key pressed will not respond except **HOME**, **F3**, and **POWER**, until the end of the statistics time.

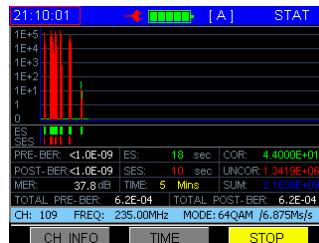


Figure 2-5-2

2.6 Tilt/Level List Measurement

A tilt/level list test is an effective solution to check a cable system's flatness and splitter's gain. ASA5510 can get levels of 12 channels and observe the measurement result and graph easily.

Press F_1 to return to main menu interface, and press F_2 or F_3 to choose the tilt icon, then press F_1 to enter Tilt/Level List Measurement.

Please select at least four channels to do a tilt test, otherwise a dialog box will pop up as shown in figure 2-6-1.

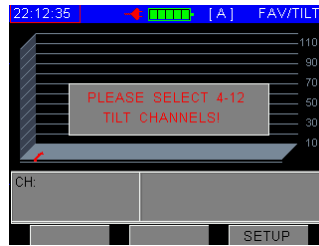


Figure 2-6-1

In figure 2-6-1, press **F3** to enter the tilt channels setup menu, select the channels that you want to perform a tilt test on as in figure 2-6-3. press **F2** or **F3** to change the highlighted line, and then press **F1** to select or unselect the channel,

Here, the and button have been set as page up and page down.

The "v" means this channel is selected. If you want to cancel this selection, please press **F1** again and the "v" will disappear. The channel No. of all channels selected will be saved and displayed in the left blocks.

| CHN | TYPE | FREQ | TILT |
|-----|------|--------|------|
| 2 | DIGI | 60.50 | ✓ |
| 3 | DIGI | 68.50 | ✓ |
| 103 | DIGI | 80.00 | ✓ |
| 7 | DIGI | 88.00 | ✓ |
| 10 | DIGI | 123.00 | ✓ |
| 103 | DIGI | 131.00 | ✓ |
| 111 | ANAG | 152.25 | |

Figure 2-6-2

After you make your selection, press to return to main menu interface, and press **F1** again to enter Tilt/Level List Measurements. Tilt measurements can now be continued.

2.6.1 Tilt Mode

In the tilt test interface, the channels will be displayed as histograms, and test results will be displayed at the bottom of the screen as in figure 2-6-3.

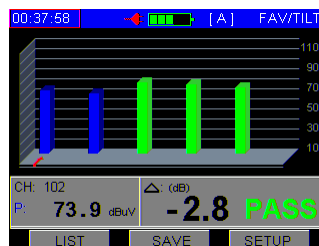


Figure 2-6-3

2.6.1.1 Soft Keys Operation

LIST (F1**)**: Press the **LIST** soft key to enter level list mode, as in figure 2-6-4.

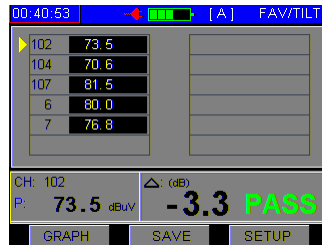


Figure 2-6-4

SAVE (F₂): Press the **SAVE** soft key and enter into figure 2-13-2 to save the results of the tilt test. Refer to section 2.13.2 for details.

SETUP (F₃): When testing, press the **SETUP** soft key and enter into figure 2-6-2 to reselect tested channels.

2.6.2 Level List Mode

Press (F₁) to switch between tilt and level list modes. In level list mode, you can easily retrieve the level values of the channels tested, as shown in figure 2-6-4.

2.6.2.1 Soft Keys Operation

LIST (F₁): Press the **GRAPH** soft key to enter tilt mode, as in figure 2-6-3.

SAVE (F₂): Press the **SAVE** soft key and enter into figure 2-13-2 to save the results of the tilt test. Refer to section 2.13.2 for details.

SETUP (F₃): When testing, press the **SETUP** soft key and enter into figure 2-6-2 to reselect tested channels.

Here, the (F₁) and (F₂) buttons can be used to switch the tilt channel. The test results will be displayed at the bottom of screen.

A **FAIL** or **PASS** will be displayed at the bottom of the screen, the limit value can be modified in Measurement Setup (Refer to section 2.4.3).

We can also disable the judge of quality of channel in the Measurement Setup.

2.7 Channel Scanning

ASA5510 has a channel scanning function in order to quickly test the flatness and amplitude of cable TV systems.

Press (F₁) to return to the main menu interface and press (F₂) or (F₃) to select the SCAN icon, and then press (F₁) to enter the Channel Scanning function as in figure 2-7-1.

The scanning graph of the current user plan is displayed on the screen. A slider in red shows the current scanning channel.

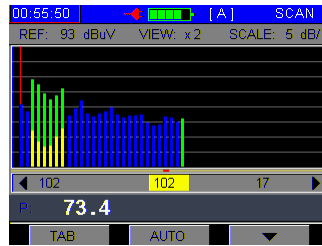


Figure 2-7-1



Green represents the video level of analog channels.



Yellow represents the audio level of analog channels.



Blue represents the power of digital channels.

The scan function also displays the scanning start channel number and end channel number.

2.7.1 Soft Keys Operation

TAB (F₁): Press this button to modify the cursor location. The parameter which is highlighted on the yellow color background can be modified by pressing  or .

MARK: In figure 2-7-1, press the  and  buttons and the red marker will move left or right. The test results of the channel at the position of the marker will be displayed at the bottom of the screen.

REFERENCE LEVEL: Press **TAB** to select REF. It can be modified by pressing  or . The range of reference level: 0-120 dBμV.

VIEW: Press **TAB** to select VIEW and switch between ×1, ×2, ×3, ×4 and ×5 by pressing  or .



×1: Max display 30 channels on screen.

×2: Max display 50 channels on screen.


×3: Max display 75 channels on screen.

×4: Max display 150 channels on screen.

×5: Max display 255 channels on screen.

SCALE: Press **TAB** to select SCALE. Switch between 1 dB, 2 dB, 5 dB, and 10 dB by pressing  or .

AUTO (F₂): Press the **AUTO** soft key to adjust reference level and scale. The meter will automatically adjust them to the most optimal state.

 (F₃): Press this button to enter the next page as shown in figure 2-7-2. Press this button again to return.

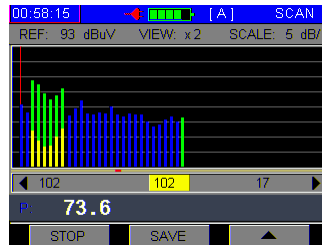


Figure 2-7-2

SAVE (F₂): Press the **SAVE** soft key and enter into figure 2-13-2 to save the results of tilt test. Refer to section 3.13.2 for details.

STOP (F₁): Press the **STOP** soft key to stop scanning. Resume scanning by pressing it again.

2.8 Spectrum Scanning

Press to return to the main menu interface and press (F₂) or (F₃) to select the spectrum icon, and then press (F₁) to enter the spectrum function.

ASA5510's spectrum function supports a double-marker display and peak-hold function as seen in figure 2-8-1. Here, you can set up span, frequency, sampling mode, etc... Press (F₁) to modify the cursor location.

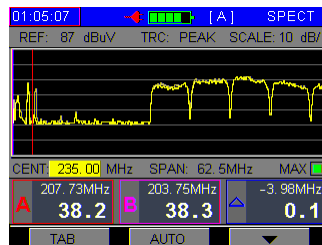


Figure 2-8-1

2.8.1 Soft Keys Operation

TAB (F₁): Press (F₁) to modify the cursor location. The selected parameter can be modified by pressing or , or by directly inputting a figure.

AUTO (F₂): Press the **AUTO** soft key to adjust reference level and scale. The meter will automatically adjust them to the most optimal state.

(F₃): Press this button to change the soft menu as in figure 2-8-2. Press this button again to return.

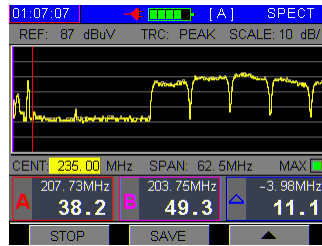


Figure 2-8-2

SAVE (F₂): Press the **SAVE** soft key and enter into figure 2-13-2 to save the results of the tilt test. Refer to section 2.13.2 for details.

STOP (F₁): Press the **STOP** soft key to stop scanning. Resume scanning by press it again.

2.8.2 Parameter Settings

You can modify or adjust measurement parameters. Press (F₁) to highlight the selected parameter and then press or , or press the character/digit keys directly.

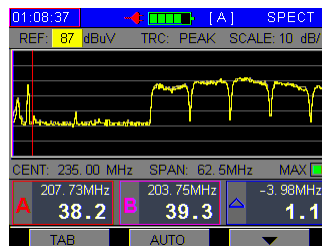


Figure 2-8-3

REFERENCE LEVEL: After selecting the REF parameter, as shown in figure 2-8-3, press or to adjust the reference level.

Note: Character/digit keys input is not supported.

TRC: After selecting the TRC parameter, press or to select the sampling mode (AVG or PEAK).

AVG: Sample average mode, the display result of each point will be an average of several sample values. It will be faster than the PEAK mode. If you want to measure the noise of the system, you need to select this mode.

PEAK: Positive-peak mode, the display result of each point will be the peak value of several sample values. Select this mode to measure the video or audio level of analog channels. See figure 2-8-4.

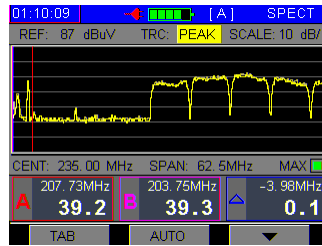


Figure 2-8-4

SCALE: After selecting the SCALE parameter, press or to choose a scale from 1 dB/, 2 dB/, 5 dB/, and 10 dB/.

CENTER FREQUENCY: After selecting the CENT parameter, you can input the center frequency using the character/digit keys.

Note: Any frequency from 5 to 1000 MHz can be input.

SPAN: After selecting the SPAN parameter, press or to adjust the span between 2.5 MHz, 6.25 MHz, 12.5 MHz, 25 MHz, 62.5 MHz, and 1047 MHz.

MAX: After selecting the MAX-HOLD parameter, if you select the MAX-HOLD by pressing or , the screen will display both the max value and the real-time value of each point.

MARKA: After selecting the MARKA parameter, the red marker A becomes the active marker. Pressing or can move the red marker to the desired view point.

MARKB: After selecting the MARKB parameter, the purple marker B becomes the active marker. Pressing or can move the purple marker to the desired view point.

2.9 HUM Measurement

ASA5510 supports HUM measurements for analog channels.

Press to return to the main menu interface and press or to select the HUM icon. Then, press to enter the HUM function as shown in figure 2-9-1.

HUM modulation is also named power hum modulation distortion, which is caused by low-frequency interference of the power (it is 50 Hz in China).

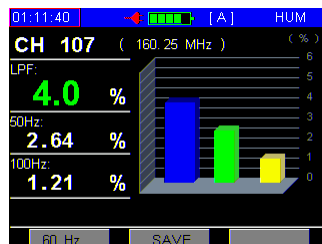


Figure 2-9-1

2.9.1 Soft Keys Operation

50Hz/60Hz (F₁): After pressing the **50Hz** or **60Hz** soft key, ASA5510 will select the system power frequency as in figure 2-9-2.

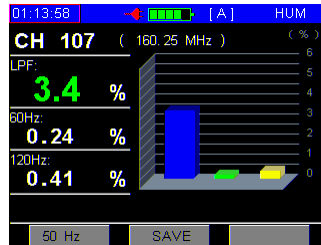





Figure 2-9-2

 or  are used to switch analog channels circularly. You can input the channel number using the character/digit keys.

SAVE (F₂): Press the **SAVE** soft key and enter into figure 2-13-2 to save the results of the tilt test, refer to section 2.13.2 for details.

2.10 Limit Measurement

Press  to return to the main menu interface and press (F₂) or (F₃) to select the LIMIT icon, then press (F₁) to enter LIMIT function. As shown in figure 2-10-1, ASA5510 is able to rapidly detect cable TV system and determine the number of unqualified channels as well as the reasons for why they are unqualified channels. The amplitude of each channel of the selected user plan is checked one by one. Whether or not the channel number, video level, and audio level are acceptable will be shown.

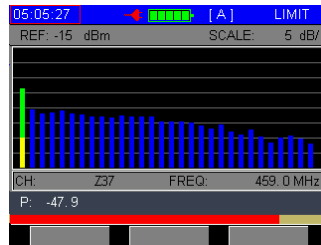


Figure 2-10-1

NOTE: ASA5510 checks the analog channel only in Limit Test mode.

2.10.1 Test Results List

After limit test scanning, the general test results of cable system will be listed. The test items consist of minimum video level, maximum video level, maximum delta video level, minimum $\Delta V/A$, maximum $\Delta V/A$, and maximum ΔADJ channels. Refer to figure 2-10-2.

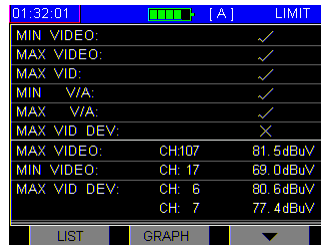


Figure 2-10-2

Press **(F1)** to see list as in figure 2-10-3.

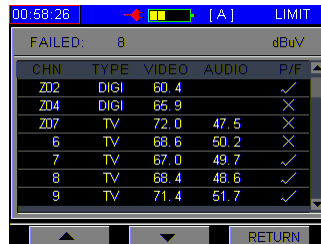


Figure 2-10-3

Press **(F2)** to view the graph as in figure 2-10-4.

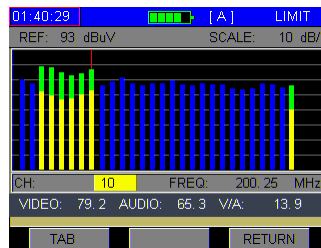


Figure 2-10-4

[Down Arrow] (F3): Press this button to enter the next page as shown in figure 2-10-5. The user can press this button again to return to the previous menu.

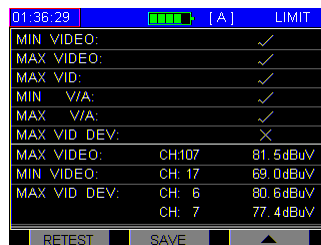


Figure 2-10-5

RETEST (F1): Press **RETEST** to retest.

SAVE (F2): Press the **SAVE** soft key and enter into figure 2-13-2 to save the results of the tilt test. Refer to section 3.13.2 for more details.

2.10.2 Limit Edit

You can edit the limit setup in **SETUP**. First, enter into the **SETUP** menu, press **F1** to enter the **MEASUREMENT** setting, and highlight **LIMIT SETUP** using **↵** or **↶**. The screen should display as seen in figure 2-10-6.

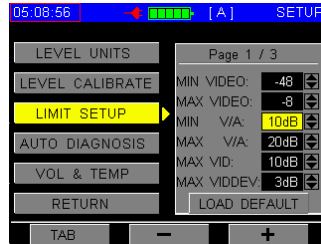


Figure 2-10-6

If you want to change a parameter, press **F1** to select the parameter, and press **F2** or **F3** to change it. Press **F1** to **LOAD DEFAULT**, and then press **F3** to select the default.

2.11 Return Path Spectrum

Press **⏮** to return to main menu interface and press **F2** or **F3** to select the R-PATH icon, and then press **F1** to enter the R-PATH function as seen in figure 2-11-1.

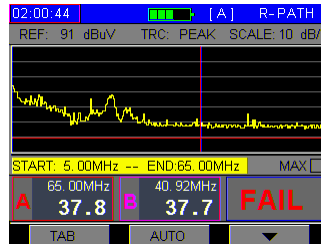


Figure 2-11-1

In the interface of the R-PATH function, the default parameters set are Start frequency: 5 MHz, Stop frequency: 65 MHz, Reference: 40 dBμV, Scale: 5 dB/div, Demodulation mode: peak mode.

To view the detailed soft key instructions, please refer to section 2.8.

2.12 Auto Test

Press the **⏮** key to return to the main menu. Press **F2** or **F3** to select the **AUTO** icon and then press **F1** to enter. The screen displays as in figure 2-12-1.

Users can store all test items in one testing project. When you start this project, the appointed items will be tested in sequence and stored in one file.

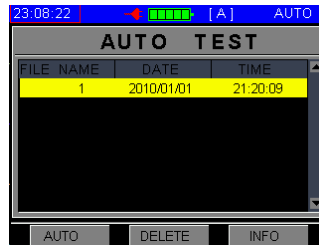


Figure 2-12-1

2.12.1 Create New Project

Highlight blank space using or , and then press the button, ASA5510 will guide you to build a new project step by step.

Step 1: Create Project Name

Press to create a new project as in figure 2-12-2. You can name the new project.



Figure 2-12-2

Step 2: Select test items

The auto test includes five items (Level Test, Spectrum, Limit Test, Tilt, and HUM). Select the test items by or keys, and disable or enable them by pressing . Green indicates the item has been enabled. Press **DOWN** to enter the next step or **UP** to return without saving. The screen displays as in figure 2-12-3.



Figure 2-12-3

Step 3: Edit test items

According to different test items, corresponsive parameter settings will appear as in figure 2-12-4.

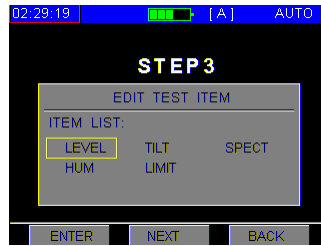


Figure 2-12-4

When editing a LEVEL test parameter, move the cursor using or and disable or enable the measured channels by pressing . The channels marked by "✓" will be tested in the LEVEL item of the auto test procedure. Be sure to confirm the entry by pressing the button and return to the previous menu, as in figure 2-12-5.



Figure 2-12-5

1. When editing tilt test parameters, move the cursor using or and disable or enable the measured channels by pressing . The channels marked by "✓" will be tested in the TILT item of the auto test procedure. Be sure to confirm the entry by pressing the button and return to the previous menu, as in figure 2-12-6.

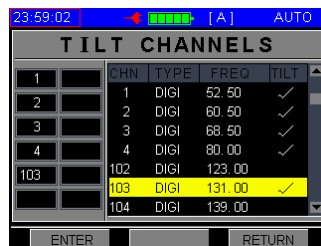


Figure 2-12-6

2. When you edit SPECT parameters, you are able to edit center frequency/span as in figure 2-12-7.

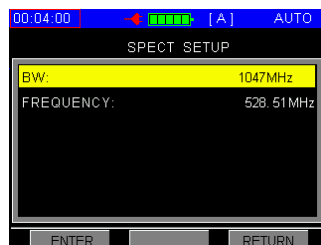


Figure 2-12-7





3. When editing HUM test parameters, move the cursor using  or  and disable or enable the measured channels by pressing . The analog channels marked by "v" will be tested in the HUM item of the auto test procedure. Be sure to confirm the entry by pressing the  button and return to the previous menu, as in figure 2-12-8.



Figure 2-12-8

4. When editing LIMIT test parameters, you can check and modify current limit parameters, and then save and exit. Refer to figure 2-12-9.

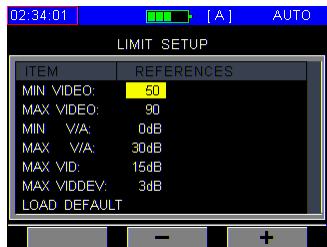




Figure 2-12-9

Step 4: Auto Start

After editing limit test parameters, press the  button and return to the previous menu. Press  to start the auto test.

2.12.2 Auto Test Storage

After the auto test, the file name will automatically be marked with a "*" as in figure 2-12-12. Users can edit the name.

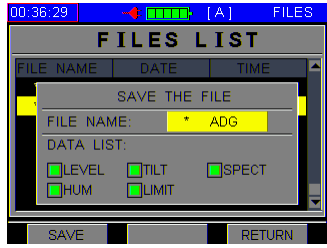






Figure 2-12-10

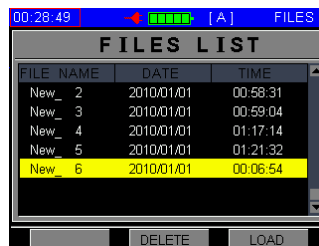
2.13 File Management

Press  to return to the main menu interface and press  or  to select the FILE icon, and then press  to enter the **FILE** management function as in figure 2-13-1.

ASA5510 has independent memory space to store measurement data. The measurement data of the level test (analog channels), QAM test (digital channels), channel scan, tilt, frequency spectrum measurement, and HUM can be stored into files.

2.13.1 File Directory



In the file list menu, all saved files are listed with file name, date, and time.






| FILE NAME | DATE | TIME |
|-----------|------------|----------|
| New_2 | 2010/01/01 | 00:58:31 |
| New_3 | 2010/01/01 | 00:59:04 |
| New_4 | 2010/01/01 | 01:17:14 |
| New_5 | 2010/01/01 | 01:21:32 |
| New_6 | 2010/01/01 | 00:06:54 |

Figure 2-13-1

2.13.2 Save File

If you are making measurements in LEVEL, TILT, SCAN, SPECT, LIMIT, and HUM (at least one of them), Press  and select the FILE icon and then press . The file list menu will display as shown in figure 2-13-2.

 will be enabled as “**NEW**,” press this button, and a “**SAVE THE FILE**” dialog will appear as shown in figure 2-13-3. ASA5510 will give a default name for the new file, or you can rename it using the character/digit keys.

After naming the new file, press  or  to select **DATA LIST**. All parameters that could be saved have been listed, and the default status is that all parameters have been selected as in figure 2-13-4.



| FILE NAME | DATE | TIME |
|-----------|------------|----------|
| New_1 | 2010/01/01 | 00:57:36 |
| New_2 | 2010/01/01 | 00:58:31 |
| New_3 | 2010/01/01 | 00:59:04 |
| New_4 | 2010/01/01 | 01:17:14 |
| New_5 | 2010/01/01 | 01:21:32 |
| New_6 | 2010/01/01 | 00:06:54 |

Figure 2-13-2

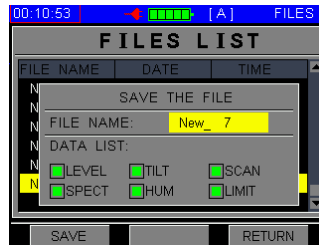


Figure 2-13-3



Figure 2-13-4

Press or to modify the cursor location, and then press to select or unselect data items as in figure 2-13-5. Press to save the file. When the new file is saved, the file list menu should display as in figure 2-13-6.

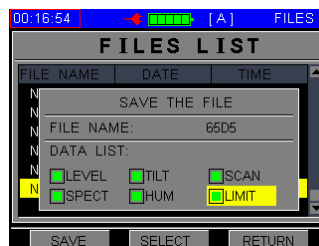


Figure 2-13-5

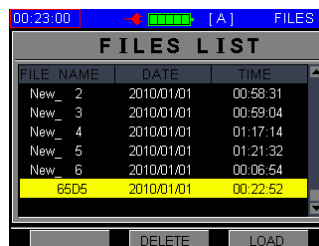


Figure 2-13-6

2.13.3 Read File

Press or to select the file you would like to read, and then press to load the file. The "LOAD THE FILE" dialog will display as shown in figure 2-13-7.



Figure 2-13-7

Normally, the data items can be opened using LIST mode (F_1). Press F_1 or F_2 to select the data item, and then press F_1 (LIST) to list a data item in LIST mode as seen in figures 2-13-8, 2-13-9, 2-13-10, 2-13-11, 2-13-12, 2-13-13, and 2-13-14.

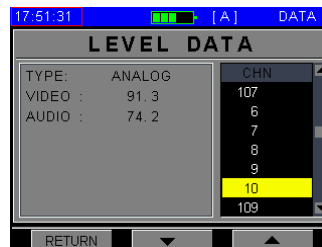


Figure 2-13-8

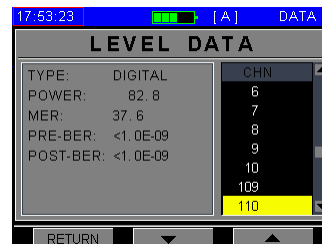


Figure 2-13-9

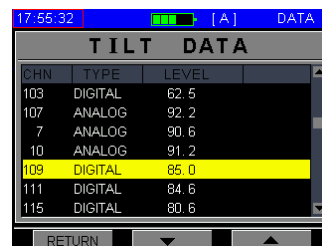


Figure 2-13-10

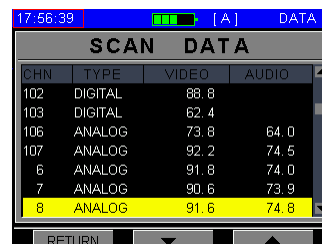


Figure 2-13-11

17:58:16 [A] DATA

SPECT DATA

| FREQ | LEVEL | MAX |
|------------|-------|-----|
| 228.75 MHz | 26.2 | |
| 228.79 MHz | 26.1 | |
| 228.83 MHz | 26.2 | |
| 228.87 MHz | 26.2 | |
| 228.91 MHz | 26.2 | |
| 228.95 MHz | 26.2 | |
| 228.99 MHz | 27.2 | |

RETURN

Figure 2-13-12

18:00:53 [A] DATA

HUM DATA

| CHN | LPF | 50/60Hz | 100/120Hz |
|-----|-------|---------|-----------|
| 6 | 2.5 % | 0.55 % | 0.79 % |

RETURN

Figure 2-13-13

00:25:01 [A] DATA

LIMITDATA

| CHN | TYPE | VIDEO | AUDIO | P/F |
|-----|------|-------|-------|-----|
| 1 | DIGI | 141.1 | | ✓ |
| 2 | DIGI | 141.1 | | ✓ |
| 3 | DIGI | 141.1 | | ✓ |
| 4 | DIGI | 141.1 | | ✓ |
| 5 | DIGI | 141.1 | | ✓ |
| 101 | DIGI | 141.1 | | ✓ |
| 102 | DIGI | 141.1 | | ✓ |

RETURN

Figure 2-13-14

2.13.4 Delete File

Select a file by pressing or and then press DELETE () to delete the selected file. The “DELETE FILE” dialog will display as shown in figure 2-13-15.

18:13:17 [A] FILES

FILES LIST

| FILE NAME | DATE | TIME |
|-----------|------------|----------|
| New_3 | 2010/01/03 | 16:35:18 |
| LEVEL1 | 2010/01/03 | 16:36:11 |
| HUM | 2010/01/03 | 18:00:53 |
| New_1 | 2010/01/03 | 17:27:51 |
| 65D6 | 2010/01/03 | 17:34:20 |

DELETE THIS FILE?

ENTER RETURN

Figure 2-13-15

Press (ENTER) () in figure 2-13-15, and the file will be deleted as in figure 2-13-16.

18:16:54 [A] FILES





| FILES LIST | | |
|------------|------------|----------|
| FILE NAME | DATE | TIME |
| New_3 | 2010/01/03 | 16:35:18 |
| LEVEL1 | 2010/01/03 | 16:36:11 |
| New_6 | 2010/01/03 | 17:07:07 |
| New_7 | 2010/01/03 | 17:27:51 |
| 65D6 | 2010/01/03 | 17:34:20 |

NEW DELETE LOAD

Figure 2-13-16

Chapter 3. Setup

3.1 Brief Introduction

Press  to return to the main interface and press  or  to select the SETUP icon, and then press  to enter the SETUP menu as in figure 3-1-1.

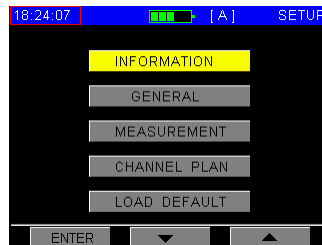


Figure 3-1-1

- **INFORMATION:** General information of the ASA5510. Includes manufacturer information, version, and so on.
- **GENERAL:** The setup includes auto shutdown time setting, language selection, date and time setting, files status, and system upgrade (NOT INSTALL).
- **MEASUREMENT:** Level unit, level calibrate, limit setup and voltage & temperature measurement.
- **CHANNEL PLAN:** The setup for channel plan includes user plan selection, learn, and edit user plan.
- **LOAD DEFAULT:** Load the default values for the system configuration.

3.2 Information

This is the information of the instrument, Refer to figure 3-2-1. It includes serial number, software version, hardware version, and so on.

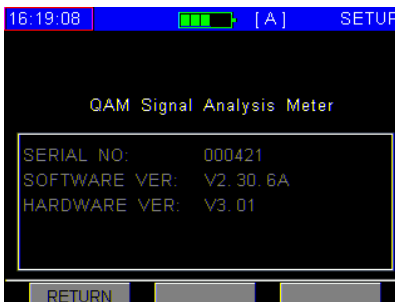


Figure 3-2-1

3.3 General

3.3.1 Shutdown Time and LCD

To save power, the instrument can be set to shutdown automatically when the keypad has been inactive for 3 minutes, 5 minutes, 10 minutes, 30 minutes and ON (never shutdown mode), as seen in figure 3-3-1.

To change the LCD brightness, user can press **F1** to select the LCD item, and then press **F2** or **F3** to change the LCD brightness.

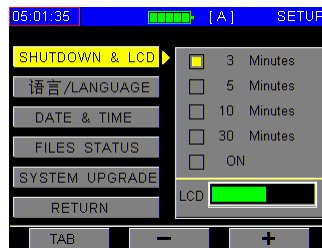


Figure 3-3-1

3.3.2 Language Selection

The language of ASA5510 can be switched between English and Chinese as shown in figure 3-3-2. After a selection is chosen, the instrument will automatically update its menus to the new language.

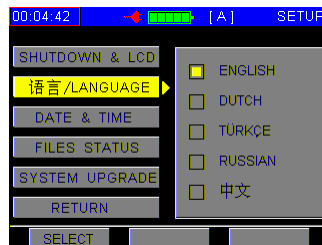


Figure 3-3-2

Note: Contact Ascent for more languages.

3.3.3 Date and Time

When there is something wrong with the system date or clock, users can the date or time, as seen in figure 3-3-3.

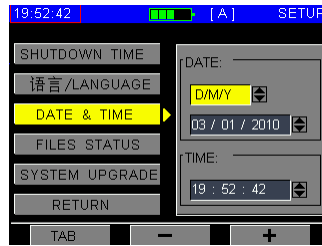


Figure 3-3-3

3.3.4 Files Status

This interface shows the number of files that have been saved, and also shows the memory status as in figure 3-3-4.

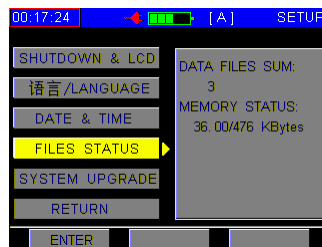


Figure 3-3-4

3.3.5 System Upgrade

This function is not installed yet.

3.4 Measurement Parameter Setup

3.4.1 Level Unit

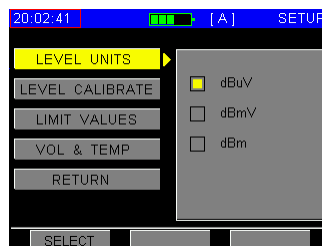


Figure 3-4-1

3.4.2 Level Calibrate

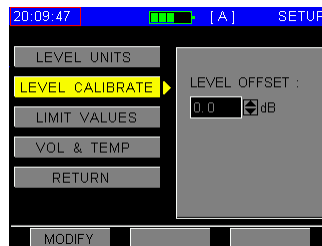


Figure 3-4-2

Users can make amendments and compensations for the measured data in all level measurement functions. press **MODIFY** (F₁) to highlight the level offset box and then press (F₂) or (F₃) to adjust it and press **ENTER** (F₁) to enable the input data.

3.4.3 Limit Setup

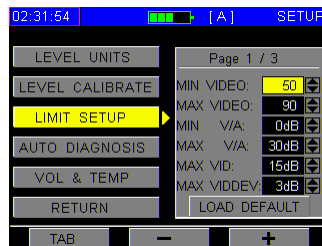


Figure 3-4-3

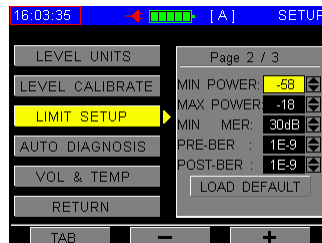


Figure 3-4-4

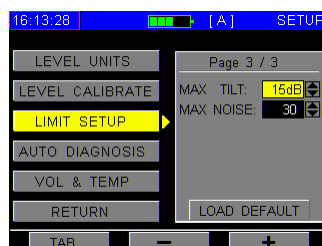


Figure 3-4-5

Three pages of limit setting have been provided as shown in figures 3-4-3, 3-4-4, and 3-4-5. Six Limit items are included in page one (1/3), which is used for single analog channel tests. The default value of these limit items are listed in Table 3-4-1. The range of these limit items are listed in Table 3-4-2. The difference between MAX VIDEO and MIN VIDEO must be greater than 6 dB.

| Item | Limit |
|----------------------|----------------|
| Minimum Video Level | 60 dB μ V |
| Maximum Video Level | 100 dB μ V |
| Minimum Δ V/A | 10 dB |
| Maximum Δ V/A | 20 dB |
| Maximum VID | 10 dB |
| Maximum VID DEV | 3 dB |

Table 3-4-1

| Item | Limit |
|----------------------|---------------------|
| Minimum Video Level | 30 ~ 99 dB μ V |
| Maximum Video Level | 31 ~ 120 dB μ V |
| Minimum Δ V/A | 0 ~ 19 dB |
| Maximum Δ V/A | 1 ~ 30 dB |
| Maximum VID | 1 ~ 30 dB |
| Maximum VID DEV | 1 ~ 20 dB |

Table 3-4-2

Page two (2/3) is used for digital channel tests. Five limit list items are included: MIN POWER, MAX POWER, MIN MER, MAX PRE-BER, and MAX POST-BER. The default value of these limit items are listed in Table 3-4-3. The range of these limit items are listed in Table 3-4-4. The difference between MAX POWER and MIN POWER must be greater than 6 dB.

| Item | Limit |
|---------------------|--------------------|
| Minimum Power Level | 50 dB μ V |
| Maximum Power Level | 90 dB μ V |
| Minimum MER | 32 dB |
| Maximum PRE-BER | 1.0E ⁻⁹ |
| Maximum POST-BER | 1.0E ⁻⁹ |

Table 3-4-3

| Item | Limit |
|---------------------|---|
| Minimum Power Level | 25 ~ 89 dB μ V |
| Maximum Power Level | 26 ~ 110 dB μ V |
| Minimum MER | 20 ~ 40 dB |
| Maximum PRE-BER | 1.0E ⁻³ ~ 1.0E ⁻⁹ |
| Maximum POST-BER | 1.0E ⁻³ ~ 1.0E ⁻⁹ |

Table 3-4-4

Page three (3/3) is used for tilt measurements. Two limit list items are included: MIN TILT and MAX TILT. The default value of these limit items are listed in Table 3-4-5. The range of these limit items are listed in Table 3-4-6.

| Item | Limit |
|--------------------|---------|
| Minimum Tilt Delta | 10 dB |
| Maximum Noise | 30 dBμV |

Table 3-4-5

| Item | Limit |
|--------------------|---------------|
| Minimum Tilt Delta | 0 ~ 30 dB |
| Maximum Noise | -10 ~ 30 dBμV |

Table 3-4-6

To set the test limit, you can choose a limit item by pressing **TAB** (F₁), and then pressing (F₂) or (F₃) to adjust it. If you want to load default values for all limit items on each page, press **TAB** (F₁) to choose the **LOAD DEFAULT** button on the bottom of that page, and then press (F₃) to confirm.

NOTE: If digital channels have been included in tilt measurement with analog channels, the power of digital channels will add a fixed offset so that it can be compared with the video of analog channels.

3.4.4 Auto Diagnosis

You can enable the auto diagnosis function (PASS and FAILURE) as in figure 3-4-6.

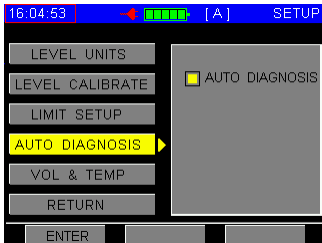


Figure 3-4-6

NOTE: Before the auto diagnosis function can work correctly, the limit items in section 3.4.3 must be set the valid values.

3.4.5 Voltage and temperature

The button “**VOL & TEMP**” here is used to enter the measurement interface shown in figure 3-4-7.

3.4.5.1 Battery Voltage

As seen in figure 3-4-7, the devices’ battery voltage will be displayed on the screen. When it is lower than 10.6V, this meter will remind you that it will shut down automatically soon.

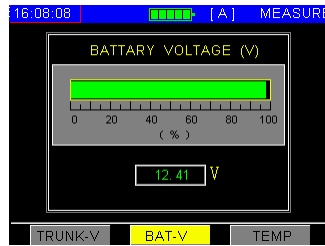


Figure 3-4-7

3.4.5.2 Trunk Voltage (AC LINE)

This meter will automatically judge whether it is AC or DC in the trunk, and display the trunk voltage on the screen as in figure 3-4-8.

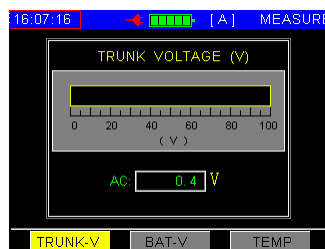


Figure 3-4-8

3.4.5.3 Temperature Inside

ASA5510 can monitor its internal temperature. Press F_2 or F_3 to choose the display unit: Celsius or Fahrenheit. Refer to figures 3-4-9 and 3-4-10.

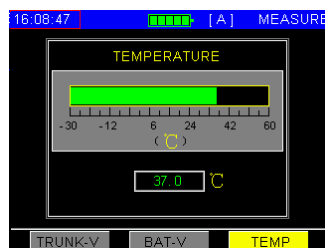


Figure 3-4-9

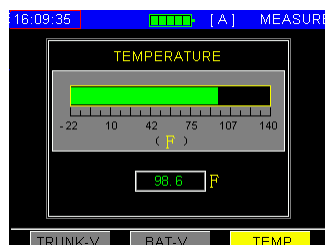


Figure 3-4-10

3.5 Channel Plan

3.5.1 Select User Plan

Up to five user plans can be built and saved. The user plans are labeled as A, B, C, D, and E. Users can choose one as the current user plan as seen in figure 3-5-1. The meter will measure according to the selected user plan.

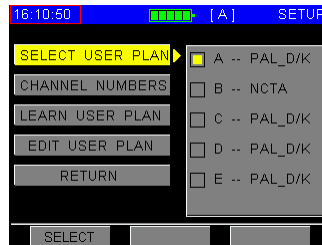


Figure 3-5-1

NOTE: ASA5510 has five default user plans.

3.5.2 Channel Number Type

You can set the channel number to be displayed in digital(numeric) mode or standard (alphanumeric) mode. After making a selection, the meter will show the channel number as you desired in any measurement mode. Refer to figure 3-5-2.

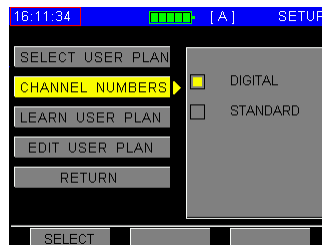


Figure 3-5-2

3.5.3 Learn User Plan

You can build and store up to five user plans in the meter. Before your first measurement, you should build a user plan to make the meter compatible with your cable system.

NOTE: The LEARN USER PLAN option will build a new user plan and replace the current selected user plan. If you build other user plans, you can enter into SELECT USER PLAN and then use the LEARN USER PLAN operation.

For detailed operation refer to section 3.2.

3.5.4 Edit User Plan

The user plan is combined by following:

- Digital (numeric) channel number
- Standard (alphanumeric) channel number
- Channel type (Analog, DIGI, Single Freq, DUAL)
- Carrier frequency
- Audio offset
- Activation status
- Modulation
- SR (Symbol rate)

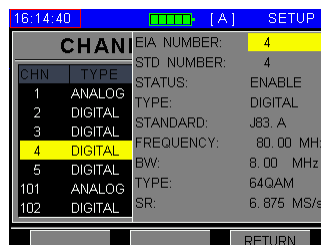


The screenshot shows a screen titled "CHANNELS LIST" with a table of channels. The table has columns: CHN, TYPE, FREQ, and VALID. Channel 1 is highlighted in yellow.

| CHN | TYPE | FREQ | VALID |
|-----|---------|--------|-------|
| 1 | ANALOG | 49.75 | |
| 2 | DIGITAL | 60.50 | ✓ |
| 3 | DIGITAL | 68.50 | ✓ |
| 4 | DIGITAL | 80.00 | ✓ |
| 5 | DIGITAL | 88.00 | ✓ |
| 101 | ANALOG | 112.25 | |
| 102 | DIGITAL | 123.00 | ✓ |

Figure 3-5-3

EDIT CHANNEL PLAN will show the channels list on the screen as in figure 3-5-3. You can only exit this function by pressing the HOME (⏠) key, press (F₂) or (F₃) to highlight a channel, and press (F₁) to edit its status as in figure 3-5-4.



The screenshot shows a screen titled "CHANNEL EDIT" with a table of channels. Channel 4 is highlighted in yellow. To the right of the table, the details for the selected channel are shown.

| CHN | TYPE |
|-----|---------|
| 1 | ANALOG |
| 2 | DIGITAL |
| 3 | DIGITAL |
| 4 | DIGITAL |
| 5 | DIGITAL |
| 101 | ANALOG |
| 102 | DIGITAL |

Details for Channel 4:

- EIA NUMBER: 4
- STD NUMBER: 4
- STATUS: ENABLE
- TYPE: DIGITAL
- STANDARD: J83. A
- FREQUENCY: 80.00 MHz
- BW: 8.00 MHz
- TYPE: 64QAM
- SR: 6.875 MS/s

Figure 3-5-4

NOTE: Any modifications made here will be saved when you exit the screen.

Chapter 4. Power Supply

4.1 Battery

ASA5510 uses a built-in 12V 1.6AH Li-Polymer battery and works for over 2 hours continuously when fully charged. When the voltage of the battery drops below 11V, the battery icon flashes on the screen. Once the voltage of the battery is lower than 10.6V, the instrument will shut down automatically. The charge time is about 8 ~ 10 hours.

NOTE:

1. The meter can be only charged using the charger provided together with ASA5510.
2. It is recommended that you turn off the instrument when charging.
3. Low temperatures may reduce the capability of the battery, but the battery will not be damaged.
4. Please replace the battery when its working hours shorten noticeably.

4.2 Charging

Please charge the instrument using the following charging process:

1. Insert the charger output plug to ASA5510 AC charge socket.
2. Connect the charger to AC 100V-240V power. The charger indicator will show a red light.
3. When the indicator changes to green, the instrument has been fully charged (it is recommended that you charge for an additional hour after the indicator changes to green in order to prolong battery life). You can then disconnect the charger input plug and pull out the charger output plug.

NOTE: The instrument should not be charged in temperatures beyond 10°C ~ 35°C, otherwise the battery life will be shortened.

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