

DS2400 Series ToolBox Software Manual

Ver 1.0

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Deviser Part No.: 2400-DL

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Preface

Welcome to use “DS2400 Toolbox” developed by Deviser, please pay attention to the following information:

Any irresolvable problems, please feel free to contact us:

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- Fax: (022)27645002
- E-Mail: overseasbiz@deviser.com.cn

We will provide a satisfactory solution as soon as possible.

If you have any opinion, please also feel free to contact us to continue to improve our products and service. Thank you very much for your support.

Declaration

Deviser has the absolute right to own the trade name of hardware and software mentioned in this manual.

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Chapter 1 Brief introduction

DS2400 ToolBox is a PC management software that designed for the DS2400 series products,including **DS2400B**, **DS2400Q** and **DS2400T**. (This software manual take the DS2400Q as an example.)

DS2400 Toolbox software is easy to set up. Using DS2400 ToolBox, you can take the real-time measure and scan. You can also select the meter settings including test parameters and develop Channel Plan configurations for download to the DS2400 units. The measurement and scan results can be save as numerical or graphical format to a PC. And the test parameters and channel plans can be conveniently downloaded to all of your DS2400 units.

DS2400 ToolBox Features:

Configure your meter

While the meter is completely configurable as a standalone unit, you can use the ToolBox to create and modify channel plans, set limits for Limit scan mode, choose level unit and temperature unit of measure and set time and date. This feature is particularly useful if you are using several DS2400 units in your organization and want to creat and maintain standard configurations for all of them.

1. Upload datalog records from your meter

You can upload information stored in your meter to the ToolBox software for processing or storage.

2. Remote Measure/Scan

You can take the real-time measure on the ToolBox software conveniently.

3. View or print the datalogs in text or graphic format

The ToolBox software can display and print analyses in text or graphic.

4. Operate and Save measurements made with your meter via the PC.

5. Upgrade your meters to the latest version.

Chapter 2 Introduction

The main functions will be introduced in this chapter, including install the DS2400 ToolBox, connecting, system setup, channel plan edit. etc.

Section 1 Installing the Toolbox software

1. System Requirements

a. Operating System:

Chinese: WindowsXP(Service Pack 2) ,Windows Vista, Win7

English: WindowsXP(Service Pack 2) ,Windows Vista, Win7

b. PC Minimum Requirement:

CPU: more than 586 300MHz

Memory: more than 64M

Hard disk: more than 200M available

2. Installing the DS2400 Toolbox

Once you have made sure that your system meets the minimum requirements, you're ready to install the DS2400 Toolbox software.

Be sure to check the CD for release notes that may affect the installation and configuration process.

To install the DS2400 Toolbox software, perform the following steps:

- a. Insert the Toolbox software CD in the appropriate drive.
- b. If you have Autorun enabled for the CD-ROM drive, the DS2400 Toolbox software setup program will start automatically. Otherwise, click "setup.exe", then click "OK".(Substitute the appropriate drive path in the command.) The Setup program starts and displays the Preparing to Install DS2400 Toolbox screen.
- c. Then you can finish the installation according to the prompted dialog box.

When you finish the installation, the DS2400 Toolbox now appears on the desktop, as



3. USB Driver Installation

The USB drivers required for the meters to communicate with the PC software are installed to your operating systems.

Maybe it has been installed automatically with the software installation, but if it has not been installed, please install it as following procedure:

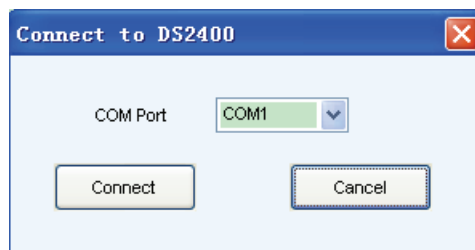
- a. Plug the data cable to your computer's USB port.(It is not necessary for the other end of the data cable to be connected to your meter for the USB driver installation.)
- b. A "Install New Hardware Wizard" will appear on your computer.
- c. Follow the Hardware Wizard prompts to find the driver from Windows Update(or from the USB Driver folder included on the software CD) and install.

Section 2 Connecting to your DS2400

Before you can set parameters, upload/download informations or take remote measurements from/to your DS2400 meter, you must connect the meter to the ToolBox software as follows:

1. Plug the data cable to your computer's USB port.
2. Plug the data cable's DIN connector into the socket on the bottom of your DS2400 and turn on your meter.
3. Start the DS2400 ToolBox software.

The "Connect to DS2400" dialog box appears.



Or you can press the  button in the ToolBox menu to get this connecting dialog box.

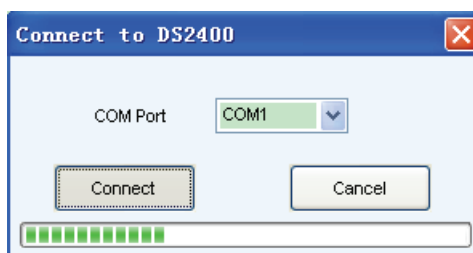
4. Select the appropriate COM port and press the "Connect" button.

Note: This COM port must be selected the same as your computer's USB serial port.

To confirm the computer's USB serial port, you can operate the computer as following steps.


Right click "My Computer"---->choose "Properties"---->select "Hardware"---->click "Device Manager"---->select "Ports(COM & LPT)".

5. A progress bar appears at the bottom of the dialog box that shows the progress as the DS2400 ToolBox software checks the connection to the DS2400 meter and establishes a link. This may take a few seconds.



6. If there is a problem with the connection for some reason, a failure message appears and you are prompted to check the connection. If the progress bar does not appear, cycle the power on your DS2400 meter and try again by selecting the




"Connect" function() from ToolBox menu.

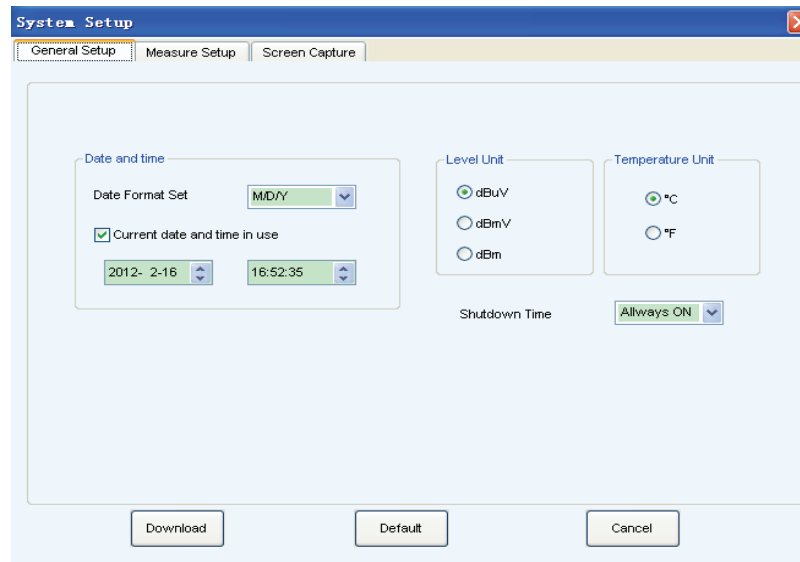
Note: The instrument will freeze when it communicate with the DS2400 ToolBox software.

Section 3 System Setup

Once the DS2400 meter is connected to the PC with ToolBox, you can use the DS2400 ToolBox software to setup your meter. In the “System Setup”, you can set general parameters and measurement specifications, as well as capture screen shots for reference later.



Select the  icon, then the “System Setup” dialog box appears as below.



In this window, there are three buttons to select.

“Download”: Once you have finished making changes, select Download button to send the configuration changes to the instrument.

“Default”: To load the default settings to the device, select the Default button.

“Cancel”: Select the Cancel button to exit without programming the configuration changes to the instrument.

1. General Setup

Select the “General Setup” tab to adjust the general setup parameters of your DS2400 meter. The following settings can be adjusted.

Date format set: Select the various portions of the date field and use the arrows to change them.

Current date and time in use: Check this to use the date and time information from the PC.

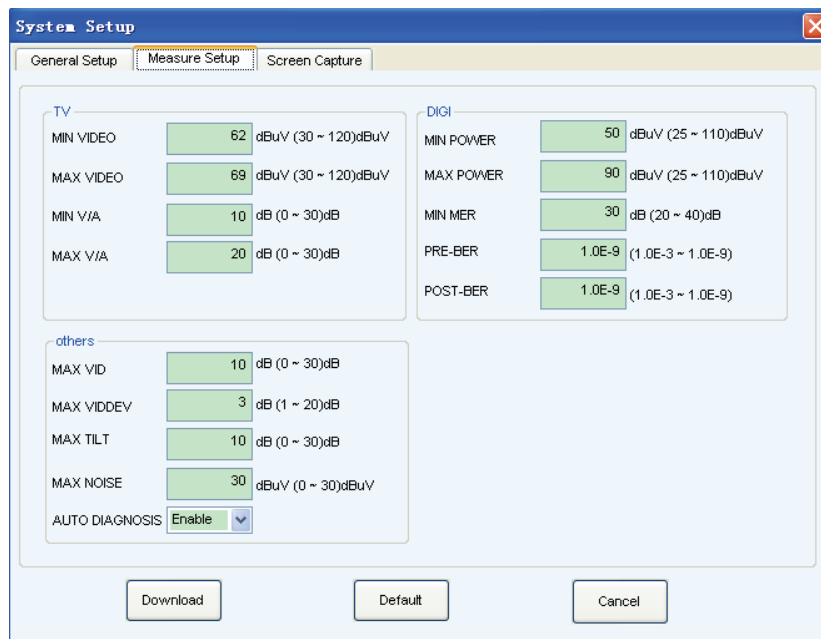
Level Unit: Select dBuV , dBmV or dBm as the level measurement unit. Setting the Level Unit also changes the units used in Toolbox.

Temperature Unit: Select °C or °F.

Shutdown Time: Select Always ON(for no shutdown), 3, 5, 10 or 30 minutes for automatic shutdown.

2. Measure Setup

Here, we only take the Level Unit at dBuV as the example.



Select the “Measure Setup” tab to adjust the measurement setup parameters of your meter. The following settings can be adjusted.

MIN VIDEO: Enter the minimum video level.

MAX VIDEO: Enter the maximum video level.

Note: The difference between MAX VIDEO and MIN VIDEO must be larger than 5dB.

MIN V/A: Enter the minimum video/audio difference(in dB).

MAX V/A: Enter the maximum video/audio difference(in dB).

MIN POWER: Enter the minimum power level.

MAX POWER: Enter the maximum power level.

Note: The difference between MAX POWER and MIN POWER must be larger than 5dB.

MIN MER: Enter the minimum tilt value(in dB).

PRE-BER : Enter the Pre-BER value.

POST-BER : Enter the Post-BER value.

MAX VID : Enter the maximum delta adjacent value.(in dB)

MAX VIDDEV : (MAX VIDEO DEVIATION) Enter the maximum video deviation value(in dB).

MAX TILT : Enter the maximum tilt value(in dB).

MAX NOISE : Enter the maximum noise value.

AUTO DIAGNOSIS : Enable or Disable the Auto-Diagnosis function using the dropdown box.

There will also have DVB-T parameters if you connect the DS2400T with this software as follows.

MIN POWER: Enter the minimum power level.

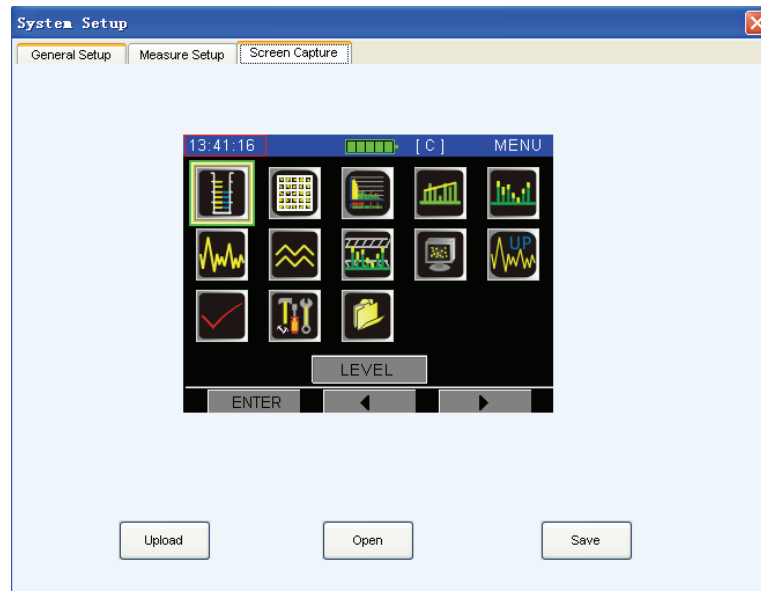
MAX POWER: Enter the maximum power level.

MIN MER: Enter the minimum tilt value(in dB).

CBER: Enter the CBER value.($1.0E-1 \sim 1.0E-5$)

VBER: Enter the VBER value.($1.0E-2 \sim 1.0E-7$)

3.Screen Capture



Select the "Screen Capture" tab to capture a bitmap image of your instrument display screen. Perform the following steps of upload,save and open screen captures.


To capture the currently displayed, select the Upload button. After a short delay, the screen capture will be displayed.

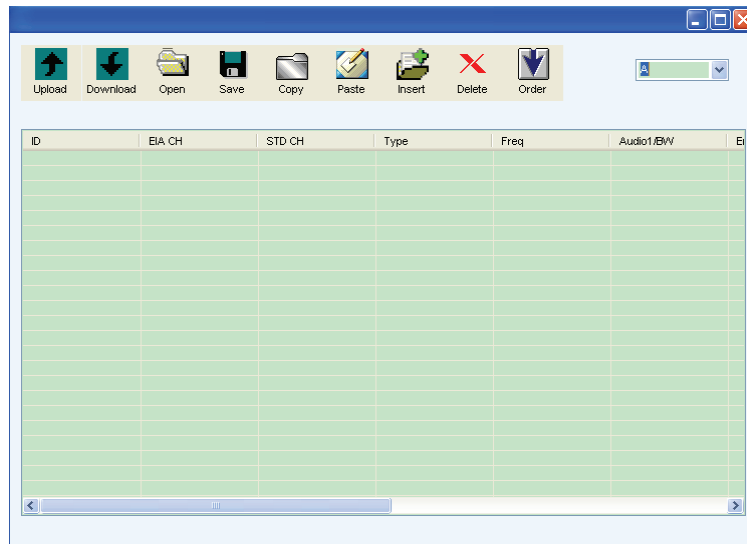
Select the Save button to save the screen capture to the PC as a BMP file.

To open any previously saved screen captures select the Open button.

Section 4 Channel Plan

A channel plan is a list of channels, frequencies and related parameters. You will probably have a variety of channel plans for your meters, depending on the cable packages and options offered to your users.


To manage the channel plans using the DS2400 Toolbox software, select the Channel Plan () button from the main menu. The channel editor window appears as shown below.




1. Uploading or Opening a Channel Plan

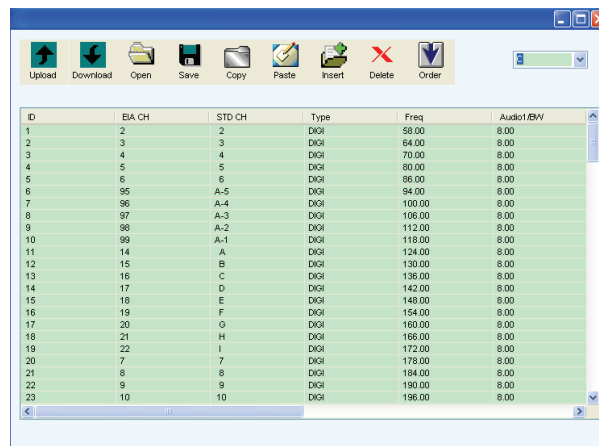
You can either upload a plan from your meter or open a plan that has been saved to disk.

To upload a channel plan from your meter, do the following:

- Connect the meter to the PC using the data cable.
- Indicate which channel plan(A-E) you want to upload using the drop-down list in the upper right corner of the display.
- Select the Upload button() to view the desired channel plan. The channel appears in the channel editor and shows as below.

To open a channel plan from disk, do the following:

- Select the Open button() .
- Select the appropriate channel plan file and select the OK button. The channel plan also appears in the channel editor.



ID	EIA CH	STD CH	Type	Freq	Audio1/BW
1	2	2	DIGI	58.00	8.00
2	3	3	DIGI	64.00	8.00
3	4	4	DIGI	70.00	8.00
4	5	5	DIGI	80.00	8.00
5	6	6	DIGI	86.00	8.00
6	95	A-5	DIGI	94.00	8.00
7	96	A-4	DIGI	100.00	8.00
8	97	A-3	DIGI	106.00	8.00
9	98	A-2	DIGI	112.00	8.00
10	99	A-1	DIGI	118.00	8.00
11	14	A	DIGI	124.00	8.00
12	15	B	DIGI	130.00	8.00
13	16	C	DIGI	136.00	8.00
14	17	D	DIGI	142.00	8.00
15	18	E	DIGI	148.00	8.00
16	19	F	DIGI	154.00	8.00
17	20	G	DIGI	160.00	8.00
18	21	H	DIGI	166.00	8.00
19	22	I	DIGI	172.00	8.00
20	7	7	DIGI	178.00	8.00
21	8	8	DIGI	184.00	8.00
22	9	9	DIGI	190.00	8.00
23	10	10	DIGI	196.00	8.00

2. Editing a Channel Plan

Once you get a channel plan in the Channel Editor, you can edit the channel plan by entering information in the fields as follows:

ID: The ID is used to number the channel rows for convenience when editing.

EIA CH: Enter a number for the EIA channel between 0 and 250.(Numbers can not be repeated.)

STD CH: Enter any combination of three letters and numbers for the STD channel.

Type: Select the TV or DIGI channel types by the dropdown box. When setting to DIGI, the frequency will automatically default to the center of the channel and bandwidth(BW) will be changed depending on the channel spacing.

Freq: Enter a channel frequency between 5 and 1000MHz.(For analog channels, enter the video frequency and for digital channels, enter the channel center frequency.)

Audio1/BW: Enter the desired primary audio frequency offset from 0.01 to 9.99MHz.

Enable: Select the Y or N in the field to enable or disable the channel. Selecting N will cause your meter to skip this channel.

Tilt: Select the Y or N in the field to enable or disable the channel for use in the Tilt mode. (4 to 12 channels may be enabled for tilt mode.)

ModeType: If a channel is set to DIGI, click the Mode Type field to select the desired modulation type for the channel. (QPSK, COFDM, 64QAM, 32QAM, 64QAM, 128QAM and 256QAM)

SR: Confirm the Symbol Rate is correct for the Digital channel.(This should be set automatically when Mode Type is selected.)

Standard: Select the standard between annex A,B or C. The channel plan annex can also be changed on your meter.

For DSS2400T, you can also edit some DVB-T parameters as below.

DVB-T Mode: If a channel is set to DVB-T, click the DVB-T Mode field to select the desired modulation type for the channel.(QPSK,16QAM and 256QAM)


DVB-T GUARD: For DVB-T channel, you can set the guard interval from 1/4, 1/8, 1/16 to 1/32.


DVB-T FFT Mode: Select the desired mode.

DVB-T code rate:Select the desired code rate between 1/2, 2/3, 3/4, 5/6, or 7/8.


DVB-T hierarchy: Select the desired hierarchy.

3. Copying/Pasting an Existing Channel


To copy an existing channel, click on the left margin next to a row's ID field to highlight the row and then select the  button on the Channel Editor toolbar.

Then click on the left margin next to the row's ID field that you would like to paste the copied channel in front of and then select the  button. You may edit the newly added channel including channel numbers, frequency and other parameters as described above.


4. Inserting a Channel

To add a Channel to an existing channel list, click the  button on the Channel Editor toolbar, then there will add a channel at the bottom of the list. You may edit the newly added channel including channel numbers, frequency and other parameters as described above.

5. Deleting a Channel


Click on the left margin next to a row's ID field to highlight the row and then select the  button on the Channel Editor toolbar to delete the row. You can select several rows to delete by holding the CTRL key down while selecting rows.

6. Ordering the Channel Plan

Press the  button on the Channel Editor toolbar, you can sort the channels in ascending frequency order.

7. Saving/Downloading a Channel Plan

When you are satisfied with your entries, select the  button to save the edited channel plan to disk as a text list.

But if you want to store this channel plan to your meter, you can select the  button to download it.


Chapter 3 Using your Toolbox

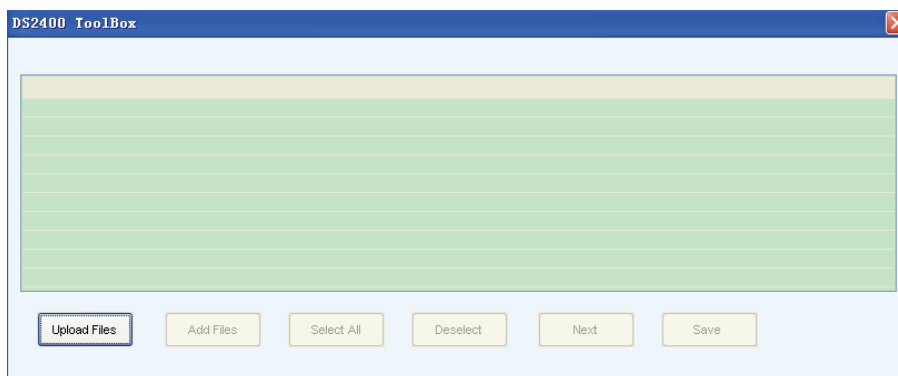
Section 1 File Management

One of the most important uses of the DS2400 Toolbox software is uploading measurement results from your meter for analysis and storage.

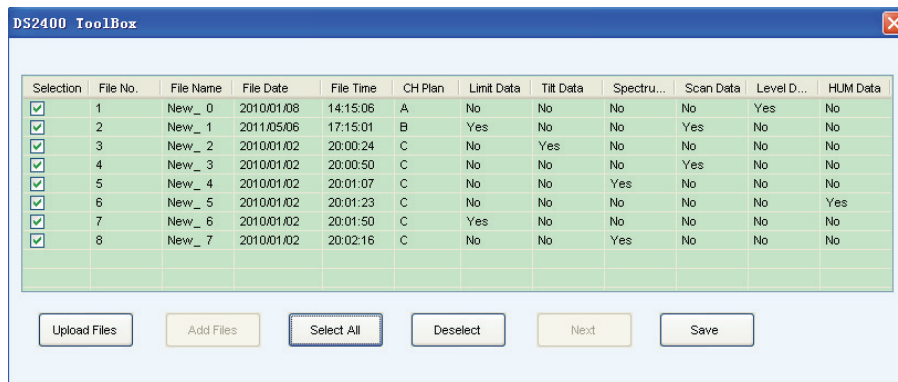
Select Files

You can classify and save files uploaded from your Meter to PC by this function.

Click  icon in the Toolbox menu, the following window will appear:

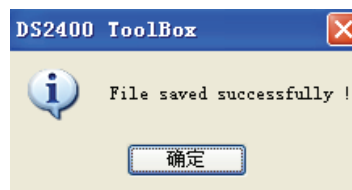


Select the "Upload Files" button to upload the measurement results from your meter to PC.



Then, check the selection box for each of the measurement results that you want to save. You can select the "Select All" or "Deselect" buttons at the bottom of the dialog box to select or deselect all the files.

When you are satisfied with your selections, select the "Save" button and specify a file to save the information to. Once the measurement results have been successfully saved, the "Files saved successfully" dialog box will be displayed as following figure.



Note: You can save records to more than one file. This can help you organize the records by location, operator, and type as necessary. For example, you might save all the measurements in your meter (Tilt, Limit, Spectrum, Scan, HUM and Level) to a single file, then save several different level measurements to a file that contains only level information.

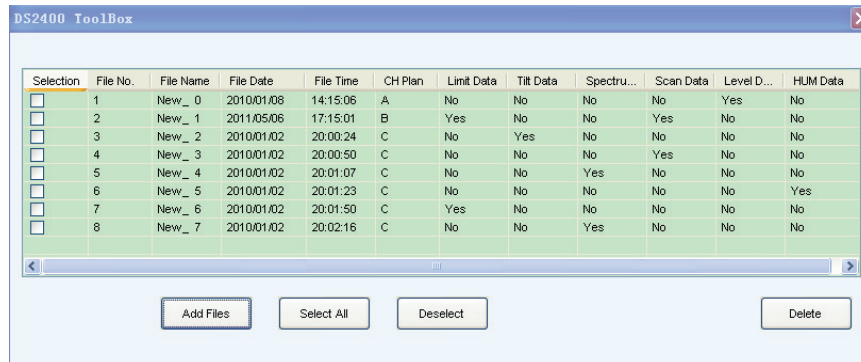
Delete Files

Here, you can delete measurement results from a database file on the PC.



Click **Delete Files** icon in the Toolbox menu, and select “Add Files” button. Then the file open dialog appears, select the database file that you wish to open and then select the “Open” button.

The DS2400 ToolBox software opens the specified database and displays the stored information.



Check the selection box for each of the measurement results that you want to delete. You can select the “Select All” or “Deselect” buttons at the bottom of the dialog box to select or deselect all the files.

When you are satisfied with your selections, select the “Delete” button to permanently remove these records from the database.

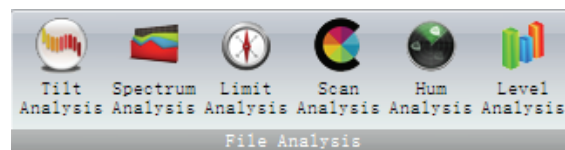
Section 2 File Analysis

You can view Tilt, Spectrum, Limit, Channel Scan, HUM and Level measurement files using the DS2400 ToolBox software. Data from several different records can be viewed graphically as overlaid or as individual displays. Information can also be listed as tabular data.

NOTE: Tilt, Scan, Limit and Spectrum files can be viewed graphically or as tabular data. But HUM and Level files can only be listed as tabular data.

The basic procedure for doing each type of data analysis mode is the same:

1. From the Main menu, select the corresponding icon for the desired analysis type: Tilt Analysis, Spectrum Analysis, Limit Analysis, Scan Analysis, Hum Analysis and Level Analysis.




2. When the desired selection screen appears, select the "Add Files" button at the bottom of the dialog box to display the available databases.
3. Select a database and select the "Open" button. The measurement results for that particular type of measurement will appear. You can open multiple databases by selecting the "Add Files" button again and opening another databases as many times as you like. You can sort the datalog records by clicking on any of the column headers to sort in ascending order.

NOTE: If the file does not contain information for the type of analysis you are doing, DS2400 ToolBox displays a message and does not load any information into the selection screen.

4. Select the measurement results that you want to analyze by checking the selection box at the left of each row. You can select the "Select All" or "Deselect" buttons at the bottom of the dialog box to select or deselect all the files. You can select several records to compare performance for different locations, operator, or times.
5. When you are satisfied with your selections, select the "Next" button. The DS2400 ToolBox displays the data for all selected records in the "Overlay" tab, with all selected records displayed on the same graph. Select the "Individual" tab to display each of the measurement graphs singly.

Tips for Viewing Measurement Results

- The units of measure for the Y axis (dBuV, dBmV and dBm) are determined by the last setting of the units on the LEVEL setup tab in the System Setup function. (In general, you won't need to change this once you have set up your meter.)
- The Overlay mode has a single marker that can be set by clicking in the graph area. The marker appears where you click. You can reset the marker position by clicking at the desired location. Data relative to the current marker position is shown in tabular form.
- Records can be viewed individually by selecting the "Individual" tab.
- Data can be viewed in tabular form by clicking the "List" tab. Before selecting the List mode, indicate the file number you wish to view by making a selection in the File # field in the lower right of the Overlay folder.
- You can print the Overlay view, the individual view or the List view. Be sure to select the desired file number before printing a list. Click "Print". DS2400 ToolBox prompts you to enter a comment for the title for the printout.
- You can change the size of the List or graph when the  appears on the dialog box.

Tilt Analysis

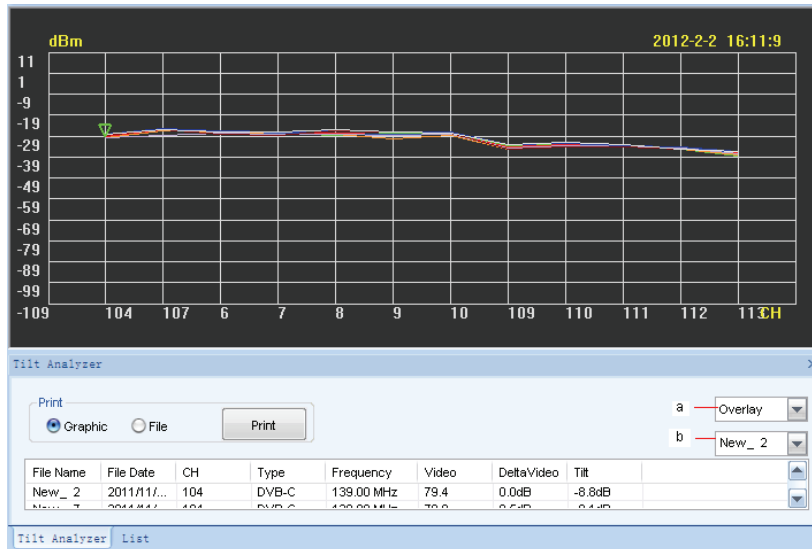


Click "Tilt Analysis" button in the Toolbox menu to view the tilt measurement results.

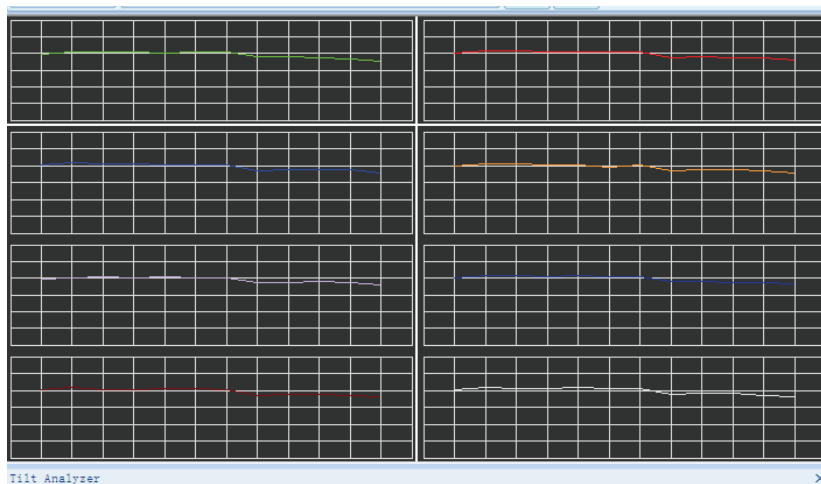
The tile analysis interface will appear with three modes: Overlay, Individual and List.

1. Overlay: both tilt graph and list.

The default display is the "Overlay" tab with all selected measurement results overlaid onto one graph, and at the bottom of this screen you can view the measurement results as a text list.



2. Individual: Each graph displays the corresponding tilt file information. Here, you can view 8 individual graphs simultaneously.



3. List: All selected tilt files will be displayed.

CH	104	107	6	7	8	9	10	109	110	111	112	Unit: dBm
New_2	-29.6	-26.7	-27.1	-27.9	-28.5	-27.5	-27.7	-33.6	-33.0	-33.7	-35	Export
New_7	-29.1	-26.1	-26.6	-27.9	-27.7	-28.0	-28.0	-34.1	-33.2	-33.9	-34	
New_10	-28.9	-26.1	-26.8	-27.6	-28.3	-28.2	-28.3	-34.6	-33.4	-33.4	-34	
New_14	-29.6	-26.6	-27.0	-28.1	-28.4	-30.5	-28.8	-35.3	-33.9	-33.7	-35	
New_16	-29.8	-28.9	-27.6	-28.1	-28.0	-28.6	-28.1	-34.9	-33.8	-33.4	-34	
New_22	-28.1	-25.4	-26.5	-26.9	-26.6	-27.2	-27.1	-32.9	-32.3	-33.7	-34	
New_23	-28.9	-25.9	-28.2	-28.9	-26.6	-27.3	-27.8	-35.1	-34.0	-34.1	-35	
New_24	-28.1	-25.9	-27.3	-26.9	-26.0	-27.1	-27.6	-33.2	-32.1	-33.0	-35	
MaxDeltaVideo	1.7	3.5	1.7	2.0	2.5	3.4	1.7	2.4	1.9	1.1	1.1	

Click "Export", the list will be saved in the specific path.

Spectrum Analysis



Click "Spectrum Analysis" button in the Toolbox menu to view the spectrum measurement files in text and graphics formats.

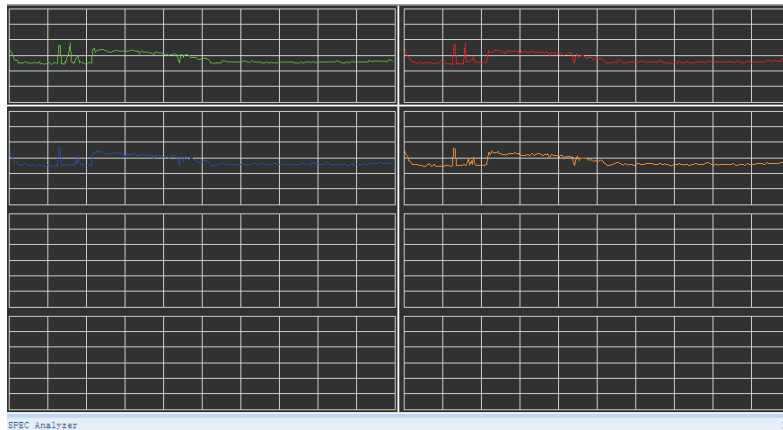
The spectrum analysis interface will appear with three modes: Overlay, Individual and List.

1. Overlay: both spectrum graph and list.

The default display is the "Overlay" tab with all selected measurement results overlaid onto one graph, and at the bottom of this screen you can view the measurement results as a text list.



2. Individual: Each graph displays the corresponding spectrum file information. Here, you can view 8 individual graphs simultaneously.



3. List: All selected spectrum files will be displayed.

Frequency	Level	Frequency	Level	Frequency	Level	Frequency	Level	Frequency	Level
5.0100	-42.40	8.3444	-44.30	11.6788	-48.90	15.0132	-52.20	18.3476	-55.30
21.6820	-55.40	25.0164	-55.40	28.3508	-59.40	31.6852	-59.40	35.0196	-59.90
38.3539	-59.40	41.6883	-58.40	45.0227	-57.40	48.3571	-57.90	51.6915	-59.40
55.0259	-58.40	58.3603	-59.30	61.6947	-59.30	65.0291	-60.20	68.3635	-59.20
71.6979	-58.20	75.0323	-58.70	78.3667	-59.10	81.7011	-58.30	85.0355	-57.40
88.3699	-60.50	91.7043	-59.60	95.0387	-60.20	98.3731	-60.80	101.7075	-60.40
105.0418	-59.90	108.3762	-59.40	111.7106	-58.80	115.0450	-59.80	118.3794	-60.80
121.7138	-59.70	125.0482	-58.70	128.3826	-59.20	131.7170	-59.60	135.0514	-58.50
138.3858	-37.40	141.7202	-36.80	145.0546	-59.60	148.3890	-60.10	151.7234	-60.60
155.0578	-57.60	158.3922	-58.50	161.7266	-49.50	165.0610	-48.50	168.3954	-33.40
171.7297	-55.30	175.0641	-59.20	178.3985	-59.00	181.7329	-58.80	185.0673	-52.70

Click "Export", the list will be saved in the specific path.

Limit Analysis

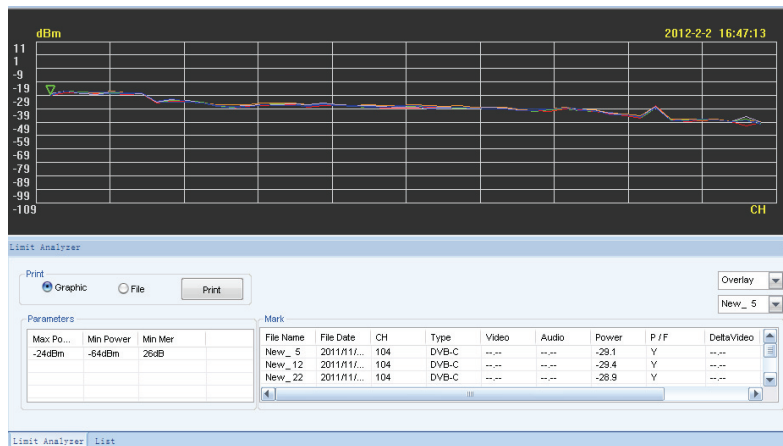


Click “Limit Analysis” button in the Toolbox menu to view the limit measurement files in text and graphics formats. The text and graphics will display the results of a complete test of each channel in the selected channel plan to the specified limits. The measurement results for the entire channel plan, such as maximum video delta and maximum adjacent channel delta are also displayed.

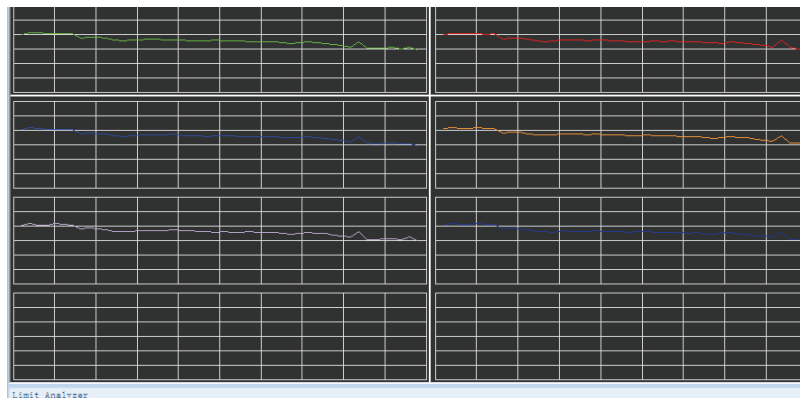
The limit analysis interface will appear with three modes: Overlay, Individual and List.

1. Overlay: both limit graph and list.

The default display is the “Overlay” tab with all selected measurement results overlaid onto one graph, and at the bottom of this screen you can view the measurement results as a text list.



2. Individual: Each graph displays the corresponding limit file information. Here, you can view 8 individual graphs simultaneously.



3. List: The file marked in the drop-down list from “Overlay” will be displayed in the “List”.

CH	Type	Video	Audio	Power	P / F
104	DVB-C	---	---	-29.1	Y
107	TV	-25.9	-43.3	---	N
6	TV	-26.5	-43.6	---	Y
7	TV	-27.4	-43.2	---	Y
8	TV	-27.3	-43.0	---	Y
9	TV	-27.4	-44.4	---	Y
10	TV	-27.5	-46.0	---	Y
109	DVB-C	---	---	-34.0	Y
110	DVB-C	---	---	-32.6	Y
111	DVB-C	---	---	-33.1	Y
112	DVB-C	---	---	-34.4	Y
113	DVB-C	---	---	-37.0	Y
114	DVB-C	---	---	-38.2	Y
115	DVB-C	---	---	-36.8	Y

Scan Analysis

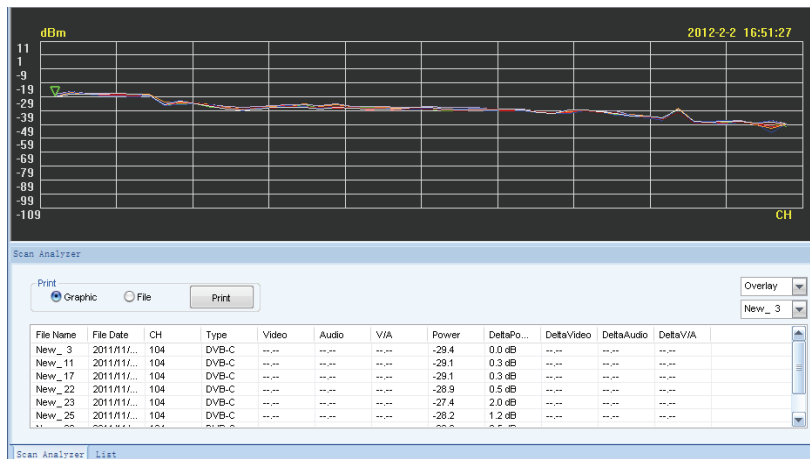


Click “Scan Analysis” button in the Toolbox menu to view the channel scan measurement files in text and graphics formats. The text and graphics will show the full span of video and audio carriers or digital power levels in the selected channel plan.

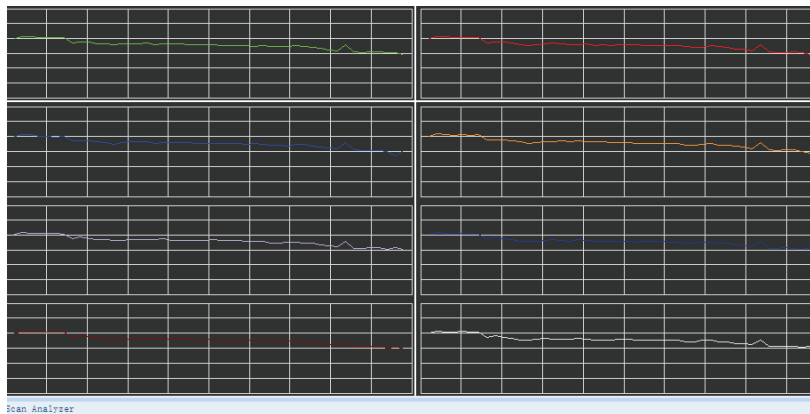
The scan analysis interface will appear with three modes: Overlay, Individual and List.

1. Overlay: both scan graph and list.

The default display is the “Overlay” tab with all selected measurement results overlaid onto one graph, and at the bottom of this screen you can view the measurement results as a text list.



2. Individual: Each graph displays the corresponding channel scan file information. Here, you can view 8 individual graphs simultaneously.



3. List: The file marked in the drop-down list from “Overlay” will be displayed in the “List”.

The screenshot shows the Scan Analyzer interface in List mode, displaying a table of scan results. The table has columns for CH, Type, Video, Audio, and Power. The unit is set to dBm. A drop-down menu shows 'New_3' selected, and an 'Export' button is visible.

CH	Type	Video	Audio	Power
104	DVB-C	---	---	-29.4
107	TV	-26.6	-44.1	---
6	TV	-27.3	-44.3	---
7	TV	-28.4	-43.7	---
8	TV	-28.4	-44.3	---
9	TV	-28.6	-45.5	---
10	TV	-28.4	-46.8	---
109	DVB-C	---	---	-35.3
110	DVB-C	---	---	-34.1
111	DVB-C	---	---	-34.2
112	DVB-C	---	---	-36.4
113	DVB-C	---	---	-37.0
114	DVB-C	---	---	-37.8
115	DVB-C	---	---	-36.7

HUM Analysis



Click "Hum Analysis" button in the Toolbox menu to view the HUM measurement files in text format.

Select the measurement results to view from the dropdown box at the top of the screen to display the measurement results as a text list.

CH	Type	LPF	60MHz	120MHz
107	TV	2.5%	0.00%	0.48%
6	TV	2.3%	0.00%	0.56%
7	TV	4.0%	0.00%	1.60%
8	TV	3.0%	0.00%	1.33%
9	TV	2.0%	0.00%	0.40%
10	TV	2.3%	0.00%	0.90%
17	TV	6.2%	2.37%	1.52%

Level Analysis



Click "Level Analysis" button in the Toolbox menu to view the level measurement files in text format.


Select the measurement results to view from the dropdown box at the top of the screen to display the measurement results are a text list.

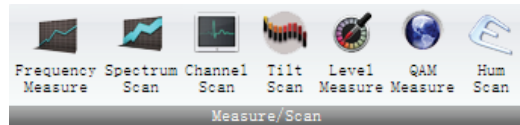
CH	Frequency	Type	VideoPower	Audio	Mer	PREBER/CBER	POSBER/VBER
104	139.00	DVB-C	-39.80		30.40	1.3E-7	<1.0E-9
107	160.25	TV	-32.00	-48.20			
6	168.25	TV	-32.30	-50.30			
7	176.25	TV	-34.90	-51.10			
8	184.25	TV	-37.20	-51.10			
9	192.25	TV	-37.10	-50.50			
10	200.25	TV	-34.00	-49.50			
109	235.00	DVB-C	-41.40		30.30	<1.0E-9	<1.0E-9
110	243.00	DVB-C	-39.90		32.90	<1.0E-9	<1.0E-9
111	251.00	DVB-C	-38.10		33.30	3.6E-7	<1.0E-9
112	259.00	DVB-C	-39.80		31.10	8.1E-9	<1.0E-9

Section 3 Remote Scan

You can perform remote measurements with your meter using the DS2400 ToolBox software.


From the main menu, select the icon for the desired remote measurements, such as Frequency Measure, Spectrum Scan, Channel Scan, Tilt Scan, Level Measure, QAM Measure and HUM Scan.

You can also change the size of the parameter list or graph when the  appears on the dialog box.

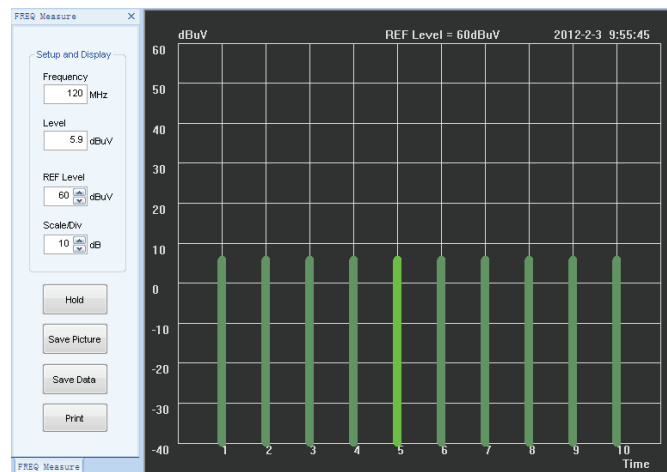


Frequency Measure

The remote Frequency Measurement function will monitor the level at any selected frequency with your meter.

Select the  "Frequency Measure" button from the Toolbox menu. Here, you can enter the desired parameters as below.

- a. **Frequency:** Input the desired frequency to monitor and press "Enter" button to confirm. (5~1000MHz)
- b. **REF Level:** Input the reference level directly or use the regulating button to change it. (-100 to 150dBuV; -160 to 90 dBmV; -208 to 42dBm)
- c. **Scale/Div:** Input the scale directly or use the regulating button to change it. (1~20dB)
- d. **Hold/Trigger:** Click "Hold / Trigger" to control the current state.
- e. **Save Picture:** Save the current graph as "###.bmp".
- f. **Save Data:** Save the test data as " ###.csv".
- g. **Print:** Print the current graph.

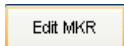
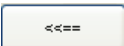
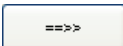
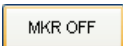



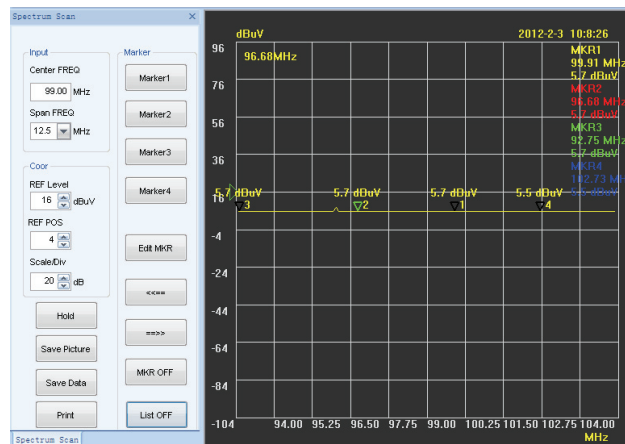
Spectrum Scan

The remote Spectrum Measurement function will monitor the selected frequency spectrum with the meter.




Select the "Spectrum scan" button from the Toolbox menu. Here, you can enter the desired parameters as below.

- a. **Center Frequency:** Input the desired frequency to monitor and press "Enter" button to confirm. (5~1000MHz)
- b. **Span Frequency:** Select a suitable frequency span from the dropdown box. (from 2.5MHz, 6.25 MHz, 12.5 MHz, 25 MHz to 62.5 MHz)
- c. **REF Level:** Input the reference level directly or use the regulating button to change it. (-100 to 150dBuV; -160 to 90 dBmV; -208 to 42dBm)
- d. **REF POS(Reference Position):** Input the reference level position directly or use the regulating button to change it. (0 to 10)
- e. **Scale/Div:** Input the scale directly or use the regulating button to change it. (1~20dB)
- f. **Marker1/Marker2/Marker3/Marker4:** Click these four buttons to activate frequency marker. You can edit the selected marker by , , ,  and .
- g. **Hold/Trigger:** Click "Hold / Trigger" to control the current state.
- h. **Save Picture:** Save the current graph as "###.bmp".
- i. **Save Data:** Save the test data as " ###.csv".
- j. **Print:** Print the current graph.



Channel Scan

The remote Channel Scan Measurement function will perform a scan of all channels in your channel plan.

Select the  "Channel Scan" button from the Toolbox menu. The current channel being scanned and its level are shown to the left of the display. You can use the mouse to select the graph to move the marker. The marker channel and levels are shown to the left of the current channel information.

You can also enter the desired parameters as below.

a. TV: Select "Video" or "Audio" to confirm the displayed informations.

b. Scan Choose: Select the desired channel on the right side of the display.

REF Level: Input the reference level directly or use the regulating button to change it. (-100 to 150dBuV; -160 to 90 dBmV; -208 to 42dBm)

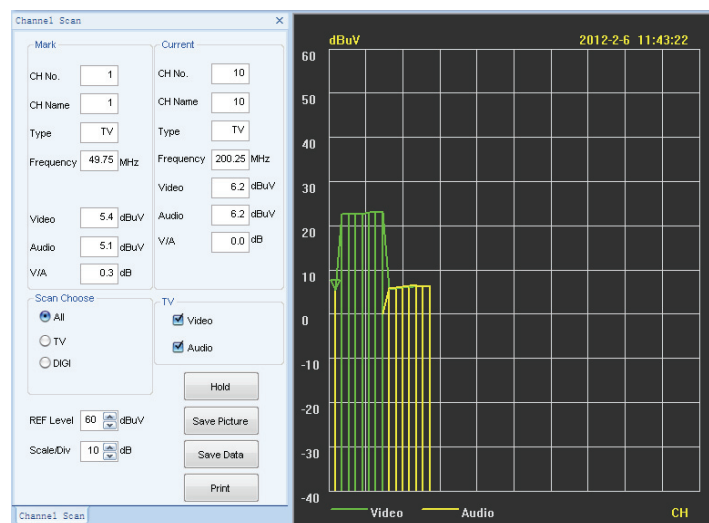
Scale/Div: Input the scale directly or use the regulating button to change it. (1~20dB)

Hold/Trigger: Click "Hold / Trigger" to control the current state.

Save Picture: Save the current graph as "###.bmp".

Save Data: Save the test data as "###.csv".

Print: Print the current graph.



Tilt Scan

The remote Tilt Measurement function will perform a scan of all Tilt (favorite) channels in your meter.



Select the "Tilt Scan" button from the Toolbox menu.

The current level of each Tilt channel is show to the left of the display.


You can also enter the desired parameters as below.

- a. **REF Level:** Input the reference level directly or use the regulating button to change it. (-100 to 150dBuV; -160 to 90 dBmV; -208 to 42dBm)
- b. **REF POS(Reference Position):** Input the reference level position directly or use the regulating button to change it. (0 to 10)
- c. **Hold/Trigger:** Click "Hold / Trigger" to control the current state.
- d. **Save Picture:** Save the current graph as "###.bmp".
- e. **Save Data:** Save the test data as "###.csv".
- f. **Print:** Print the current graph.



Level Measure

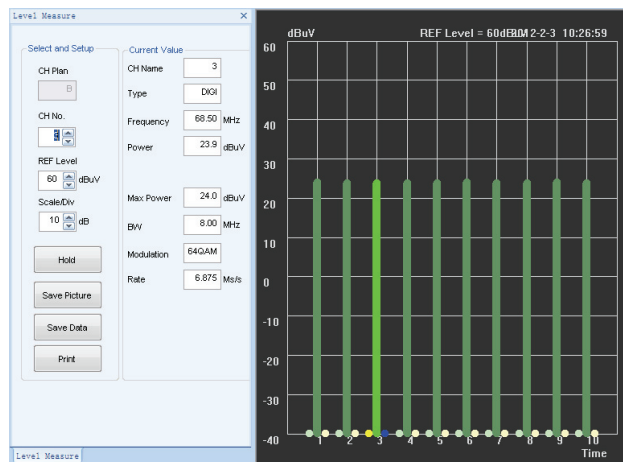
The remote Level Measurement function will monitor the level of any selected channel with your meter.

Select the  "Level Scan" button from the Toolbox menu.

Select the desired channel and ToolBox will perform a channel measurement scan. The current level of the selected channel is shown at the left of the display.


You can also enter the desired parameters as below.

- a. **CH No.:** Input the desired channel number to scan directly or use the regulating button to change it.
- b. **REF Level:** Input the reference level directly or use the regulating button to change it. (-100 to 150dBuV; -160 to 90 dBmV; -208 to 42dBm)
- c. **Scale/Div:** Input the scale directly or use the regulating button to change it. (1~20dB)
- d. **Hold/Trigger:** Click "Hold / Trigger" to control the current state.
- e. **Save Picture:** Save the current graph as "###.bmp".
- f. **Save Data:** Save the test data as "###.csv".
- g. **Print:** Print the current graph.



QAM Test

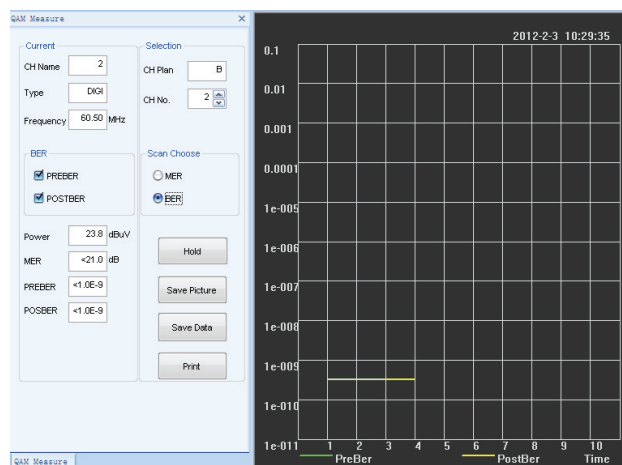
The remote QAM Measurement function will measurement any selected digital QAM channel with your meter.

Select the  "QAM Measure" button from the Toolbox menu.

Select the desired channel and test (BER or MER) on the left side of the display, then the ToolBox software will perform a measurement scan of the channel. And the current measurements of the selected channel are shown at the left margin of the display.

You can also enter the desired parameters as below.

- a. **CH No.:** Input the desired channel number to measure directly or use the regulating button to change it.
- b. **Scan Choose:** Select the "MER" or "BER" to test QAM.
- c. **Hold/Trigger:** Click "Hold / Trigger" to control the current state.
- d. **Save Picture:** Save the current graph as "###.bmp".
- e. **Save Data:** Save the test data as "###.csv".
- f. **Print:** Print the current graph.



HUM Scan

The remote HUM Measurement function will perform a HUM measurement scan for any selected analog channel with your meter.

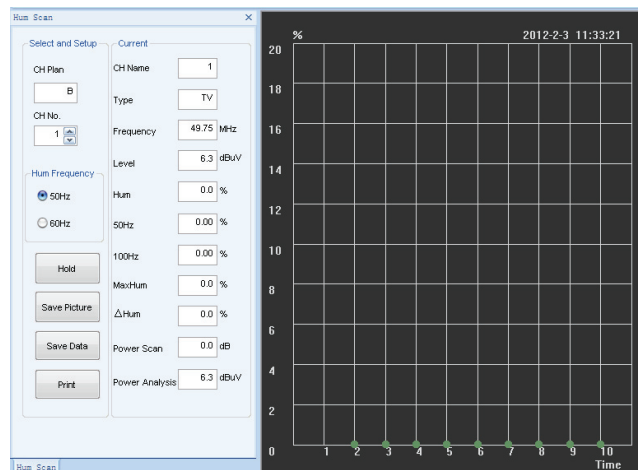


Select the "Hum Scan" button from the Toolbox menu.

Select the desired(analog) channel on the left side of the display and ToolBox will perform a HUM measurement scan of the selected channel. The current measurements of the selected channel are also shown at the left of the display.

You can also enter the desired parameters as below.

- a. **CH No.:** Input the desired channel number to measure directly or use the regulating button to change it.
- b. **Hum Frequency:** Select 50Hz or 60Hz to test.
- c. **Hold/Trigger:** Click "Hold / Trigger" to control the current state.
- d. **Save Picture:** Save the current graph as "###.bmp".
- e. **Save Data:** Save the test data as "###.csv".
- f. **Print:** Print the current graph.

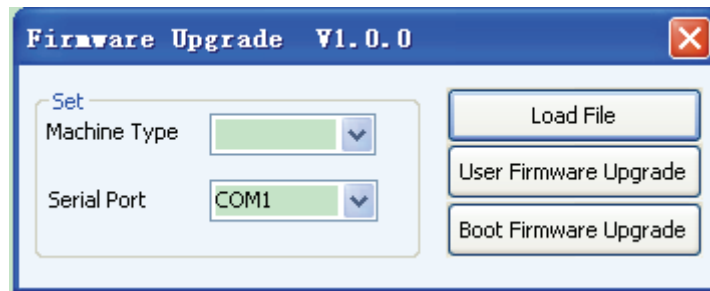


Chapter 4 Upgrade



This chapter tells you how to upgrade your meter to the latest version.

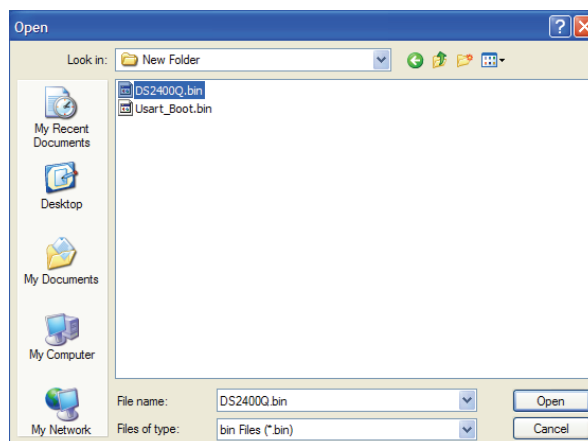
Note:

1. When upgrading the meter, please keep it power on and don't interrupt the process, otherwise it will cause the meter frozen.
2. Start the DS2400 Toolbox software. The "Connect to DS2400" dialog box appears, but here, you have to select the "Cancel" button, because the COM Port can not be used repeatedly for both measurement and upgrade at the same time.
3. Before upgrade, please check if the new firmware is match with your hardware by Serial number.




To upgrade the User Firmware, perform the following steps:

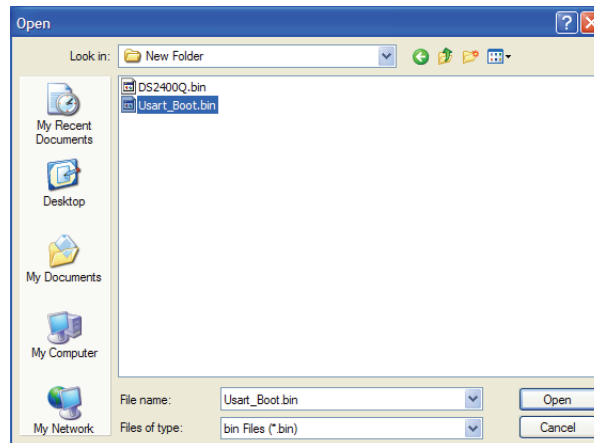
- a. Press "F2" key and " key and hold (for about 5 seconds), then turn on the meter. Then the meter's screen will become blue.
- b. Connect your meter to the PC using the data cable.
- c. Select the  button from the Toolbox menu.
- d. Set the "Machine Type" and "Serial Port" to upgrade.
- e. Click the "Load File" button to upload the desired user firmware file, then click the "User Firmware Upgrade" button to upgrade.



- f. Once the upgrade is finished, the "User Firmware Upgrade successfully" dialog box will be displayed.

To upgrade the Boot Firmware, perform the following steps:

- a. Turn on your meter.
- b. Connect the meter to the PC using the data cable.
- c. Select the  button from the Toolbox menu.
- d. Set the “Machine Type” and “Serial Port” to upgrade.
- e. Click the “Load File” button to upload the desired boot firmware file, then click the “Boot Firmware Upgrade” button to upgrade.



- f. Once the upgrade is finished, the “Boot Firmware Upgrade successfully” dialog box will be displayed.