

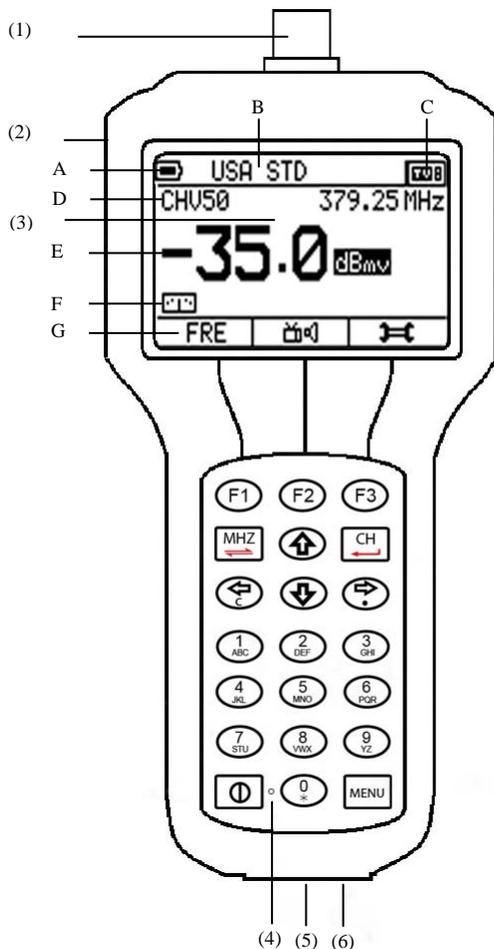
CT-DLM870D



TV SIGNAL LEVEL METER USER MANUAL



1. Overview



- (1) RF input
- (2) Speaker
- (3) LCD display
- (4) Charger indicator
- (5) RS232 communication port
- (6) DC-IN port

- A. The battery icon shows the remaining power of battery.
- B. The current channel plan.
- C. The current test mode.
- D. The current channel number and video carrier frequency.
- E. The signal strength.
- F. Signal level bar.
- G. Soft keys of function menu, corresponding **F1 F2 F3**

F1 F2 F3 Functional keys corresponding to functions indicated on the bottom of the screen.

0 to **9** Numeric keys. used for input of number, or short-cut to test mode in the main menu. In test mode, **0** is used for saving test result as a file. **0** is used to enter file management menu from the main menu.

↑ ↓ ← → Arrow keys. **←** is also used as backspace key when inputting a number. **→** is used as a dot when inputting a number.

-  Channel input key and enter key.
-  Frequency input key and escape key.
-  Main menu key.
-  Power key.

2. Power on and setup

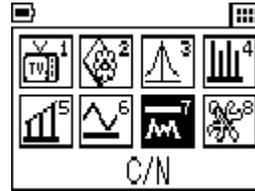
Power On

To turn meter on, press , the meter will “buzz” and enter the main menu.

Menu instruction

Press , the meter will display the main menu. The main menu includes below items in according with the number in the icon.

- 1 Level measurement
- 2 Auto measurement
- 3 Spectrum analysis
- 4 Scan
- 5 Tilt
- 6 Voltage
- 7 C/N
- 8 Setup



You can directly enter each measurement using short-cut of the number in the icon.

Setup the meter

Set the meter before using instrument, all settings will be stored in the memory devices. In Menu mode, press the ARROW buttons to select “SETUP” and press , the screen will display items as shown in Figure 2.

- 01 SHUTDOWN TIME
- 02 LEVEL UNIT
- 03 LANGUAGE
- 04 CHANNEL PLAN
- 05 CONFIG PLAN...
- 06 EDIT PLAN...
- 07 CREATE PLAN...
- 08 RESTORE
- 09 SOFTWARE VER.
- 10 HARDWARE VER.

11. SERIAL NUMBER

Using arrow keys or **F2** select the desired item and then press **CH** or **F3** to enter, using arrow keys or **F2** toggle the option, then press **CH** or **F3** to confirm the setup.

Shutdown time

In order to save energy, this meter can be set to automatically shut down when there is no operation.

Automatic shutdown time options:

10minutes
20minutes
30minutes
Always on



Level unit

The current unit of measurement shows in the bottom of the screen and you can toggle among below units:

dBuV
dBmV
dBm



Language

Chinese
English



Channel Plan

Using arrow keys select the item and press **F3** to enter the setup, press **F2** to select the desired channel plan, and then press the **F3** again to save.



Configure plan

In this setup menu, you can set the default settings of all channels.

- 1 Bandwidth
- 2 Audio IF
- 3 Digi mode
- 4 Mode
- 5 Symbol rate
- 6 Save settings

After setting all items, using arrow keys select "Save settings" and press **F3**, and select "YES" in the pop-up then press **F3** to confirm.

Edit Plan

The user can edit the channel plan items INCLUDING:

Channel number, availability, channel type, video carrier frequency, bandwidth and sound carrier frequency; when the channel type is set to digital, it can also be the digital channel center frequency, bandwidth, modulation mode, and the symbol rate.

Channel Type: digital signal / analog signal

Channel bandwidth: 1MHz - 9.9MHz

Modulation: 16/32/64/128/256QAM

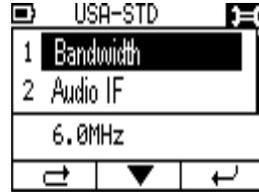
Symbol rate: 1M - 7M

Create Plan

The following steps can create a user channel table:

1. Connecting cable.
2. In the "SETUP" menu, select "CREAT PLAN..." and press **F3** to enter.
3. The unit will show below content:

Using the **F2** to select the channel plan of your TV system and then press the **F3** or **CH** key to start. The progress bar shows the degree of created.



CHAN	FREQ	TYPE	SELE
2	55.25	Anal	
3	61.25	Anal	
4	67.25	Anal	
1	73.25	Anal	
5	77.25	Anal	



When finished, using arrow keys select YES to preserve and select NO to escape, then press **F3** to confirm.

Note:

The unit needs to access a cable television system.

The unit will automatically select the channels with signal strength greater than -20dBmV (40dBuV or -67dBm) and collect them into the user channel plan, recognizing analog or digital channel. However, due to the complexity of the actual signal, the user may also need to re-edit it.

Users can edit the user channel plan in the menu of "EDIT PLAN..."

Restore

If you want to set the unit to factory default, select "RESTORE" and press **F3** or **CH** to confirm



Software version

In the "SETUP" menu, select the "SOFTWARE VER." The software version will be displayed like below figure:



Hardware version

In the SETUP menu, select the "HARDWARE VER." The hardware version will be displayed like below figure:



Serial number

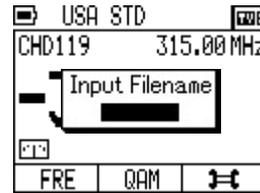
In the SETUP menu, select "SERIAL NUMBER". The serial number will be displayed like below figure:



3. Start to Use

Save and manage files.

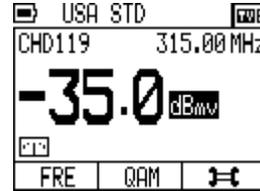
In any test modes, you can save test result as a file and review in future. Press **9**, there will be a pop-up “Input Filename”, input the file name here and press **CH** to confirm. The file will be saved. Press **MENU** to cancel and quit the pop-up.



To manage the saved file, press “9” in main menu and you will enter file management mode. Using arrow button highlight the file and press **F1** to select one or more files, press **F2** to delete the selected files, press **F3** to review the highlighted file.

Single Digital Channel Measurement

In main menu, select “LEVEL” icon and press **CH** or directly press **1** to enter single channel measurement mode.



First set the current channel type. Press **F3** to display channel setup window.

If the channel type is digital channel, it will display:

1. Channel NO.
2. Type
3. Frequency
4. Bandwidth
5. Mode
6. Symbol rate
7. Save settings

If the channel type is analog channel, it will display:

1. Channel NO.
2. Type
3. Frequency
4. Bandwidth
5. Audio IF
6. Save settings

Using arrow key highlight an item and press **F3** to enter, using **↑** **↓** arrow key to toggle options or directly enter parameter using keypad, and press **F3** or **CH** key to confirm.

In the single digital channel measurement mode, the channel number is shown "CHD" instead of "CHV" that the analog channel number is shown. In the middle of the screen it displays the digital average power.

Soft key function definition

- F1** Enter the spectrum analysis of current channel
- F2** QAM, enter QAM analysis mode
- F3** Channel setup

Change the Channel under Test

1. Press   keys to change the channel number in the sequence of channel plan.
2. Using the keypad directly input the desired channel to be measured, and press .

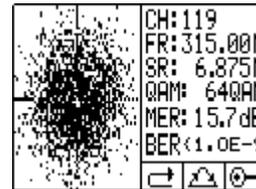
Press **F1** to enter spectrum analysis of current channel mode, for detailed operation, please refer to 3.3 spectrum measurement.



Press **F2** to enter the QAM measurement, as shown in Figure:

Enter the symbol rate using keypad and press **F1** again to confirm and highlight next parameter – MODE (modulation type).

Using   arrow key toggle the modulation type until it shows the correct option and press **F3** again to confirm.



Press **F3** to fresh the measurement.

Press **F3** or  to enter constellation analysis. To zoom in the display, using arrow keys to highlight the quadrant you want to zoom in and press **F3** or .

Single Analog Channel Measurement

In the single analog channel measurement mode:

Soft keys definition:

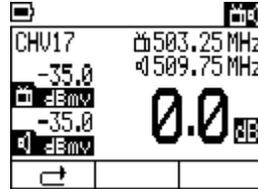


- F1** Enter spectrum analysis of current channel
- F2** Enter A/V measurement mode
- F3** Channel NO., Type, Frequency, Bandwidth, Audio IF, Save settings

Press **F1** to enter the spectrum analysis of current channel. For details, please refer to 3.3 spectrum measurement.

Press **F3** to set the type of analog channel or digital channel.

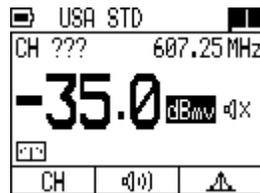
Press **F2** to enter A/V measurement mode, simultaneously display the channel audio and video carrier frequencies and signal strength, as well as the relative difference between the two.



Single Frequency Measurement Mode

In channel measurement modes, using keypad manually input any desired frequency and press **MHZ**. If an audio carrier exists on this frequency it will be heard through the speaker. As this unit is equipped with an FM demodulator, this will measure signal strength of any transmitted FM signal, and play the audio.

In frequency measurement mode, press **MHZ** continuously, the cursor blinks indicating the step of 100MHz, 10MHz, 1MHz, 100KHz, 10KHz, you can increase or decrease the frequency by pressing **F4** **F5** keys in the step where the cursor is located.



Channel Audio Carrier Signal Strength

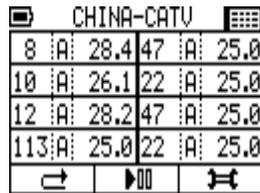
In the single analog channel measurement mode, press **CH** to shift the unit between video carrier frequency mode (shows CHV in the channel number) and Audio carrier Frequency mode (shows "CHA" in the channel number).



The unit will display the audio carrier frequency, the signal strength and play the audio.

3.2 Auto test mode.

In the main menu, press **F4** **F5** keys until the unit



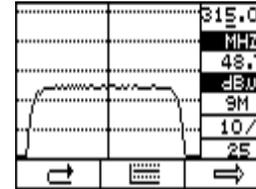
shows "AUTO" in the bottom of screen, press , the meter enters auto test mode.

Press  to enter setup of auto test channels, you can select up to 8 channels for auto test. Using   keys highlight the desired channel and press  or  to select. Press  to get back to auto test menu, press  and the selected channels will be tested and the signal level of analog channel or power of digital channel will be shown in the list.

CH	FREQ	TYPE	SELE				
10	200.25	Anal	<input checked="" type="checkbox"/>				
11	208.25	Anal	<input type="checkbox"/>				
12	216.25	Anal	<input checked="" type="checkbox"/>				
1	8	2	10	3	12	4	113
5	47	6	22	7	47	8	22

3.3 Spectrum measurement

In the main menu, press the   keys until the unit shows "SPECT" in the bottom of screen, press , the meter enters spectrum measurement mode.



Using keypad input center frequency and press , or input channel number and press , the unit will enter single channel spectrum analysis mode and the center frequency is the channel center frequency and the bandwidth turns to 9MHz.

Using  toggle the cursor of center frequency, then using   tune the frequency. Press , then using   adjust the reference level. Press   key to move the marker.



Press  to enter next page of soft keys.

Press  to toggle the DIV setting of the testing graphic among: 1dB, 2dB, 5dB, 10dB, 20dB.

Press  to toggle the bandwidth of spectrum analysis in steps of 4.5MHz, 9MHz, 27MHz, 54MHz, All.

3.4 Scan

In the main menu, press the   key until the unit shows "SCAN" in the bottom of screen, press , the meter enters SCAN measurement mode.

Press  and using   adjust the reference level by step of 5dB.



Press **F3** to toggle the DIV setting among 1dB, 2dB, 5dB, 10dB, 20dB.

Press the **←** **→** arrow keys, you can move the marker, the channel bar that the marker located will show on the screen, as well as signal strength.

Press **F1** to “zoom in” or “zoom out”. You can move the marker to view the channels out of the screen. The number to display at a time depends on the screen. It is about 100 channels when zooming out to the maximum.

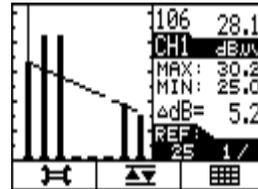
3.5 Tilt Measurement

In the main menu, select the TILT measurements, press **CH** to enter.

Signal strengths of 8 channels display in the screen synchronously. Using **F2** toggle the DIV among 1dB, 2dB, 5dB, 10dB, 20dB. Press **F3** to view the testing results in list instead of graphic bar. Press **F3** again or press **F1** to quit to previous menu.

In TILT mode, press **F1** to enter the setup menu. You can set up to 8 channels for TILT test here. Using **↑** **↓** highlight the desired channel and press **CH** to select. Press **F3** to confirm after selection. Press **F2** to view the channel list and press **F1** to quit to previous menu.

The max signal strength, min signal strength and their difference display on the screen.



106:A	25.0	10:A	25.0
107:A	25.3	110:A	25.0
7:A	31.3	115:A	25.0
9:D	25.0	119:A	25.7

ΔdB=14.2 dB

CH	FREQ	TYPE	SELE
106	152.25	Anal	<input checked="" type="checkbox"/>
107	160.25	Anal	<input checked="" type="checkbox"/>
6	168.25	Anal	<input type="checkbox"/>

1	106	2	107	3	7	4	9
5	10	6	110	7	115	8	119

3.6 Trunk Voltage Measurement

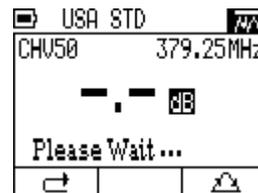
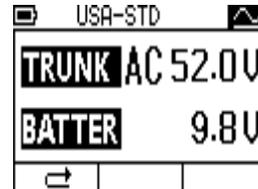
In the main menu, select the “VOLTAGE” item, press **CH**, the meter will enter the voltage measurement mode. As shown in below figure.

The meter will automatically identify “AC” or “DC” of the trunk voltage, and display on the screen. The battery voltage also display on the bottom.

Typically at the cable demarcation point outside the structure, there will be no trunk voltage.

3.7 Carrier to Noise Ratio Measurement

In the main menu, select the “C/N” item and press **CH** to enter the signal noise ratio measurement mode.



Note:

The function affects when the signal input level is greater than 60 dBuV.

4. Power supply

Power Supply

The meter is equipped with a high performance rechargeable battery. The voltage of battery can be monitored automatically, the meter shall alarm when power is low. Press the voltage measurement key, the instrument shall show the battery voltage.

The meter powers off automatically if there is no operation for set power-off time.

Please use only the charger provided with the meter, using any other battery charger may overheat or distort the meter, or cause fire, injury or harm to the environment and will void the warranty. The indicator on the front panel will turn red when the instrument is being charged. The charging can be done when both the meter is power on and power off.



CT-DLM870D
TV SIGNAL LEVEL METER
Quick Start Guide



- Make certain that the battery is fully charged.
- Turn the unit **ON** by pressing .
- The unit will “buzz” and enter the main menu after displaying the logo and model number.
- Using arrow keys highlight the **SETUP** menu and press  key or directly press  on keypad, the meter will enter **SETUP** menu and display setting items.
- Using arrow keys, highlight “**SHUTDOWN TIME**” and press , select a “**SHUTDOWN TIME**” mode of your choice, and then press  to confirm.
- Next to “**SHUTDOWN TIME**”, select the “**LEVEL UNIT**” option. The display shows three available units of measure, “**dBμV**” “**dBmV**” and “**dBm**”. It is common in the industry to refer to RF signal strength as dB. In reality, the unit of measure is dBμV or dBmV varying from different countries. Using the arrow keys, select the desired unit and press the  key to confirm.
- Next in the “**LANGUAGE**” item, select the desired language.
- In the next item “**CHANNEL PLAN**”, select the desired channel plan.
- Next item is “**CONFIG PLAN**”. Here you can set the default settings of all channels.
- Next item is “**EDIT PLAN**”. Here you can set the parameters of each single channel.
- Next item is “**CREATE PLAN**”. Here you can automatically enable all channels of selected channel plan those are higher than -20dBmV, 40dBuV or -67dBm, and disable others. Press  to enter the menu, connect the meter to CATV system, using  select the channel plan of your TV system and then press  or  to start. The progress bar shows the degree of created, when finished, using arrow keys select YES to preserve and select NO to escape, then press  to confirm.
- Press the  or  to return to the main menu.
- Using the arrow keys to select “**LEVEL**” and press , or directly press numeric  key, you will enter the signal level test mode.
- The display will show the channel number, video frequency and video carrier signal strength.
- Using a supplied “F” coupler, connect the CATV signal lead to the input located at the top of the instrument.

- The unit should immediately display the video carrier signal strength of current channel.
- Press the arrow keys to move to the next or previous channel.
- Direct channels may be entered by pressing appropriate number keys, then pressing



- Direct single frequencies may be entered by pressing MHz button, followed by the appropriate number keys
- To select a direct frequency, press  until the cursor highlights a value and use the   to change the value.
- To test the digital channel, using the arrow keys, move to a digital channel and press  to show channel setting window.
- Using the arrow keys, highlight "TYPE" and press . Using arrow keys change the type to "Digital" and show options of digital channel. Enter correct parameters and press . Or you can directly quit by pressing , the settings will be saved automatically.
- The channel number will become "CHD" instead of "CHV". The channel power will show on the screen. Press , the display enter QAM analysis menu and show the results of "MER", "BER" as well as the graphics of constellations after pressing .
- The instrument will now display the video carrier strength of the selected channel on the display. It is this carrier signal that is critical. Typical cable company requires this signal be within $\pm 5\text{dB}$ of 0, at the demarcation point outside the structure, as well as all cable outlets within.
- Note that signal strength of considerably lower than 55dBuV/-5dBmV may still provide satisfactory reception, depending upon the quality and size of the connected television receiver.