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## **A Overview of S110/S110D Signal Level Meter**

S110/S110D Signal Level Meter is an instrument used for the construction and maintenance of analog TV / digital TV, and the measurement of TV signal level and power level. It is widely applied in the routine maintenance of the CATV system. S110/S110D Signal Level Meter is compatible to both analog / digital channels, with strong comprehensive performances; it employs high brightness backlight operating modes, with clear LCD screens, dual-channel measurement display, so it is convenient and pragmatic; besides, numeric keypad input allows it easy to operate; S110/S110D is a compact, small light-weight portable signal level measuring instrument, suitable for making tests in various environments.

## **B Features of S110/S110D Signal Level Meter**

1. A test instrument applicable for the maintenance of CATV system;
2. Compact, light-weight, easy to carry;
3. With high-capacity lithium battery, so it can work for a long time;
4. With dual-channel measurement display, it is convenient and pragmatic;
5. Able to measure C/N, V/ A, slope and mains voltage.

## **C Precautions**

1. The instrument uses 7.4V/3200mAh lithium battery, please charge the battery for at least two hours before you use it for the first time.
2. Please charge the battery of this machine using the charger provided by the Company, otherwise, users may thus suffer unnecessary losses.
3. The instrument shall not work in the environment where there is strong electromagnetic field, which will cause inaccurate measurement results.
4. The RF input socket, the maximum input voltage (AC or DC) of the instrument shall be not exceed 100V, otherwise the instrument may be damaged.
- 5 The instrument has automatic power-off function, if there are no key operations within three minutes, it will be powered off automatically.

**D Panel and LCD**



RF input socket

LCD

Keypad

Charger slot

**E Instructions of keys**













Single-channel measurement key




Single-frequency measurement key



Dual-channel one-screen display / slope measurement key


	Carrier-to-noise measurement key
	Mains voltage & battery voltage measurement key, backlight
ON/OFF	
	The key for increasing number of channels
	The key for decreasing number of channels
	Speaker ON/OFF
	The key for switching channel input and entering decimal point
	Number keys 1~9
	Power ON/OFF
	The key for switching analog / digital and entering "0"
	The key for confirming what you have entered

### (1) Single-channel measurements

Press  key, the instrument will enter a single channel measurement mode, the information as follows will appear in the LCD:





The moment the left bottom of the screen displays the channel number of current channel, while the right bottom displays current channel of the vision carrier frequency, the left-hand side of the screen shows V / A value of current channel (vision carrier level and aural carrier level difference), while the right-hand side of the screen shows current channel of the vision carrier level.

Press  key to shift between digital / analog channels, the instrument will enter the mode of measuring average power level of digital channels, the information as follows will appear in the LCD:




The moment the left bottom of the screen shows the channel number of current digital channel, the right bottom of display center frequency of digital channels, the right-hand side of screen shows the average power level of current channel

Press  or  key to increase or decrease channel number, you can also change

the number of channels by directly entering numbers using number keypad.


## (2) Single-frequency measurement

Press  key, the instrument will enter the mode of single frequency measurement, the information as follows will appear in the LCD:




The moment, "F--" appears on the right bottom of screen, while aural carrier (or FM) frequency of the channel appears on the right bottom of the screen, and the level of aural carrier appears on the left-hand side of the screen.

You can change the frequency values by directly entering numbers using number keypad. This state can be used for TV aural carrier level or FM signal level value.


Press  key, turn on (or off) the aural function, which is only turned on in this state, but turned off in any other measurement state. While Aural function is turned on, the sound icon on the screen will blink continuously; however, this icon will disappear if it has been turned off

## 3. Slope measurements (dual-channel display in one screen)

Press  key, the instrument will first enter the dual-channel one-screen measurement mode.






The moment the left bottom of the screen displays the channel number of the first channel (high-end), while the right bottom displays the channel number of the second channel (low-end), the left top of the screen shows the vision carrier level of the first channel, while the right top shows the vision carrier level value of the second channel.


Press  key to shift between digital / analog channels, the information as follows will appear in LCD:



The moment the left top of the screen shows the average power level of the first digital channel, the right top of the screen shows the average power level of the second digital channel.

Press  key to shift between channel input of the first channel and the second channel, when switching channels, the "CH" icon of the selected channel will blink for twice indicating current channel is the selected channel.

Press  or  key to increase or decrease channel number, you can also change the number of channels by directly entering numbers using number keypad.

Press  key again, the instrument will enter the slope measurement mode, the information as follows will appear in the LCD:






The moment the left bottom of the screen displays the channel number of the first channel (high end) while the right bottom of the screen displays the channel number of the second channel (low end), the left top of the screen shows the vision carrier level value of the first channel, while the right top shows the difference between the vision carrier level of the first channel and the vision carrier level of the second channel, which is also known as slope.

Press  key to shift between digital / analog channels, see Figure below:



The moment the left top of the screen shows the average power level of the first digital channel, while the right top shows the difference between the average power level of the first channel and the average power level of the second channel

Press  key to shift between channel input of the first channel and the second channel, when switching channels, the "CH" icon of the selected channel will blink for twice indicating current channel is the selected channel.

Press  or  key to increase or decrease channel number, you can also change the number of channels by directly entering numbers using number keypad.

Notes: the difference between dual-channel one-screen measurement mode and slope measurement mode is: the measurement values appearing on the left top and right top as well as their units are different, for example, the unit of level is dBuV, while the unit of

slope is dB.

#### 4. Carrier-to-noise ratio measurement

Press **C/N** measurement key, the instrument will enter the carrier-to-noise ratio measurement mode, the information as follows will appear in the LCD:



The moment the left bottom of the screen displays the channel number of the measured channel, while the right bottom shows the value of the vision carrier frequency of the measured channels, the left-hand side of the screen displays vision carrier level value of the measured channel, the right-hand side of the screen shows the carrier-to-noise ratio value of the measured channel.

The instrument supports two measurement methods, i.e.: the way of closing front-end carrier and the way of online measurement: after the instrument enters the carrier-to-noise ratio measurement mode, it will first enter online measurement method, and display the carrier-to-noise measurement value. If the moment you close the front-end carrier, the instrument will automatically enter the way of closing front-end carrier and display carrier-to-noise ratio measured value.

Press **↑** or **↓** key to increase or decrease channel number, you can also change the number of channels by directly entering numbers using number keypad.

#### Notes:

1. When the carrier level is less than 85dBuV, the carrier-to-noise ratio value displayed will be "Err".
2. When the carrier-to-noise ratio is  $\geq 50$ dB, the carrier-to-noise ratio value displayed will be 50dB.
3. When the carrier-to-noise than is  $\leq 20$ dB, the carrier-to-noise ratio value displayed will be are 20dB.
4. The way of closing front-end carrier is better than the way of online measurement (in which the carrier is not closed), because the latter will produce bigger errors. To make the measurement result more accurate, please choose modulation switch-off measurement method using spectrum analyzer

#### 5 voltage measurements



Press **VOLT** key, the instrument will enter the mains voltage measurement and the battery voltage measurement mode. The information as follows will appear in LCD:




The moment shown AC (or DC) appears on the left bottom of the screen, indicating the voltage of the measured mains is AC (or DC). The left-hand side of the screen shows the mains voltage value, while the right-hand side shows the voltage value of internal battery.

## 6. LCD backlight


The LCD backlight is set to be “off” when the instrument is started. If you use the instrument at night work or the work environment has poor light, you can turn the LCD backlight following the steps below.

1. First press  key to enter voltage measurement mode.
2. First press  key again, if the LCD backlight is turned off, the LCD backlight will be turned on; if the LCD backlight is turned on, the LCD backlight will be turned off.

### Notes:

1. Using LCD backlight will reduce the working hours of the instrument.
2. Do not carry out any other operation after pressing  key and before pressing the same key for a second time, otherwise the backlight will not be able to turned on.

## 7. Power supply

The instrument is powered by internal 7.4V/3200mAh lithium battery, in the event that the battery is fully charged, it can work continuously for more than six hours (with audio and LCD backlight turned off). When the battery voltage is below 6.5V, the battery icon on the screen will appear as “” and blink continuously, in order to remind the user of insufficient power volume in the battery. Please charge the instrument using the charger supplied by the company.

### Notes:

1. When the voltage of internal battery is below 6.3V, the instrument will be powered off automatically.
2. Please charge the instrument using the charger supplied by the company! If you use other chargers, the Company will not be liable for warranty or any damage thus incurred.

## 8. Specifications

### Frequency / channel

Range of frequency: S110 47MHz ~ 870MHz

S110D 5MHz ~ 870MHz

Channel: U.S. Standard Channel USA STD-CATV



U.S. digital standard channels USA STD-CATV

Frequency accuracy:  $\pm 50 * 10E-6$  (20 °C  $\pm 5$  °C)

Resolution: 50KHz

Measurement bandwidth: 280KHz  $\pm$  50KHz

#### Level measurement

Measuring range: 30dBuV ~ 120 dBuV

Measurement accuracy:  $\pm 2$ dB (20 °C  $\pm 5$  °C)

Resolution: 0.5dB

Detection method: peak detection

Input Impedance: 75 $\Omega$  (unbalanced, F-type connector)

#### Carrier-to-noise ratio measurement

Measuring range: 20dB ~ 50 dB

Signal input range:  $\geq 85$ dBuV

Measurement accuracy:  $\pm 3$ dB (20 °C  $\pm 5$  °C)

Resolution: 0.5dB

#### Voltage measurement

Input range: 1 ~ 100V (AC / DC)

Measurement accuracy:  $\pm 2$ V

Resolution: 1V

Operating temperature: 0 °C to 40 °C

#### Power supply

Battery: 7.4V / 3200mAH lithium battery

Working time: $>$  6 hours (audio / LCD backlight off)

Charging time:  $\leq 3$  hours

External power supply: INPUT: 100 ~ 240V ~ 800mA 50 ~ 60Hz

OUTPUT: 9V ~ 2000mA

#### Accessories

The power of the special charge: HX lithium battery charger	1 pcs
RF input connector: F-type	1 pcs
Strap:	1 pcs
Bag:	1 pcs
User's Manual:	1

#### Others

Dimensions: 210mm \* 95mm \* 48mm

Total Weight:  $\approx 650$ g

Audio output: built-in speaker (single-frequency mode manual start)

1. Appendixes

U.S. Standard Channels (USA STD-CATV)

Standard channel No.	Channel No.	Vision carrier frequency	Aural carrier frequency	Center frequency
T07	201	7	11.5	8.75
T08	202	13	17.5	14.75
T09	203	19	23.5	20.75
T10	204	25	29.5	26.75
T11	205	31	35.5	32.75
T12	206	37	41.5	38.75
T13	207	43	47.5	44.75
T14	208	49.25	53.75	51
2	2	55.25	59.75	57
3	3	61.25	65.75	63
4	4	67.25	71.75	69
5A	1	73.25	77.75	75
5	5	77.25	81.75	79
6	6	83.25	87.75	85
A-5	95	91.25	95.75	93
A-4	96	97.25	101.75	99
A-3	97	103.25	107.75	105
A-2	98	109.25	113.75	111
A-1	99	115.25	119.75	117
A	14	121.25	125.75	123
B	15	127.25	131.75	129
C	16	133.25	137.75	135
D	17	139.25	143.75	141
E	18	145.25	149.75	147
F	19	151.25	155.75	153
G	20	157.25	161.75	159
H	21	163.25	167.75	165
I	22	169.25	173.75	171
7	7	175.25	179.75	177
8	8	181.25	185.75	183
9	9	187.25	191.75	189
10	10	193.25	197.75	195
11	11	199.25	203.75	201
12	12	205.25	209.75	207
13	13	211.25	215.75	213
J	23	217.25	221.75	219
K	24	223.25	227.75	225
L	25	229.25	233.75	231
M	26	235.25	239.75	237
N	27	241.25	245.75	243

O	28	247.25	251.75	249
P	29	253.25	257.75	255
Q	30	259.25	263.75	261
R	31	265.25	269.75	267
S	32	271.25	275.75	273
T	33	277.25	281.75	279
U	34	283.25	287.75	285
V	35	289.25	293.75	291
W	36	295.25	299.75	297
AA	37	301.25	305.75	303
BB	38	307.25	311.75	309
CC	39	313.25	317.75	315
DD	40	319.25	323.75	321
EE	41	325.25	329.75	327
FF	42	331.25	335.75	333
GG	43	337.25	341.75	339
HH	44	343.25	347.75	345
II	45	349.25	353.75	351
JJ	46	355.25	359.75	357
KK	47	361.25	365.75	363
LL	48	367.25	371.75	369
MM	49	373.25	377.75	375
NN	50	379.25	383.75	381
OO	51	385.25	389.75	387
PP	52	391.25	395.75	393
QQ	53	397.25	401.75	399
RR	54	403.25	407.75	405
SS	55	409.25	413.75	411
TT	56	415.25	419.75	417
UU	57	421.25	425.75	423
VV	58	427.25	431.75	429
WW	59	433.25	437.75	435
AAA	60	439.25	443.75	441
BBB	61	445.25	449.75	447
CCC	62	451.25	455.75	453
DDD	63	457.25	461.75	459
EEE	64	463.25	467.75	465
	65	469.25	473.75	471
	66	475.25	479.75	477
	67	481.25	485.75	483
	68	487.25	491.75	489
	69	493.25	497.75	495
	70	499.25	503.75	501
	71	505.25	509.75	507

72	72	511.25	515.75	513
73	73	517.25	521.75	519
74	74	523.25	527.75	525
75	75	529.25	533.75	531
76	76	535.25	539.75	537
77	77	541.25	545.75	543
78	78	547.25	551.75	549
79	79	553.25	557.75	555
80	80	559.25	563.75	561
81	81	565.25	569.75	567
82	82	571.25	575.75	573
83	83	577.25	581.75	579
84	84	583.25	587.75	585
85	85	589.25	593.75	591
86	86	595.25	599.75	597
87	87	601.25	605.75	603
88	88	607.25	611.75	609
89	89	613.25	617.75	615
90	90	619.25	623.75	621
91	91	625.25	629.75	627
92	92	631.25	635.75	633
93	93	637.25	641.75	639
94	94	643.25	647.75	645
100	100	649.25	653.75	651
101	101	655.25	659.75	657
102	102	661.25	665.75	663
103	103	667.25	671.75	669
104	104	673.25	677.75	675
105	105	679.25	683.75	681
106	106	685.25	689.75	687
107	107	691.25	695.75	693
108	108	697.25	701.75	699
109	109	703.25	707.75	705
110	110	709.25	713.75	711
111	111	715.25	719.75	717
112	112	721.25	725.75	723
113	113	727.25	731.75	729
114	114	733.25	737.75	735
115	115	739.25	743.75	741
116	116	745.25	749.75	747
117	117	751.25	755.75	753
118	118	757.25	761.75	759
119	119	763.25	767.75	765
120	120	769.25	773.75	771

121	121	775.25	779.75	777
122	122	781.25	785.75	783
123	123	787.25	791.75	789
124	124	793.25	797.75	795
125	125	799.25	803.75	801
126	126	805.25	809.75	807
127	127	811.25	815.75	813
128	128	817.25	821.75	819
129	129	823.25	827.75	825
130	130	829.25	833.75	831
131	131	835.25	839.75	837
132	132	841.25	845.75	843
133	133	847.25	851.75	849
134	134	853.25	857.75	855
135	135	859.25	863.75	861
136	136	865.25	869.75	867