



SCARLET | TECH

Class1 Sound Level Meter

ST-15D



- IEC-61672-2002 Class 1
- Recording Function
- 10 Hz...20 kHz frequency range
- 20 dB...142 dB measurement range
- Modularize design provides 4 sub models

| Meter vs. Analyzer

A sound level meter is a device that allows you to determine the acoustic intensity and to measure the sound pressure level, but does not necessarily determine levels of sound in relation to tolerance of the human ear. Scarlet Tech ScarletSound™ sound level meters are suitable for professional application, including measurement of sound at work and environmental sound measurement.

Sounds analyzers provide octave bands analysis to help Safety Manger identify exactly noise sources easily by looking into the most relevant frequency components. The frequency domain information is based on DSP technology. ScarletSound™ ST-15D is the one you need.

| Modularization

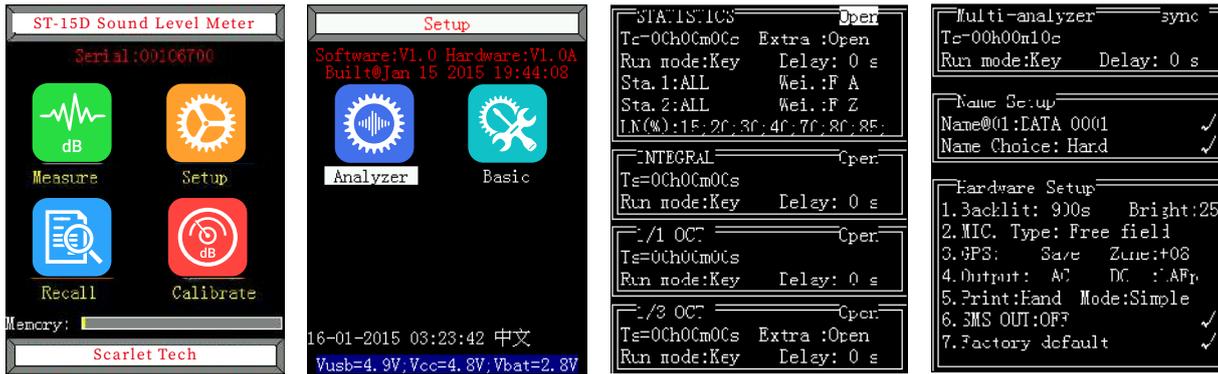
ST-15D series is designed by dividing major functions into modules. By installing different modules, ScarletSound™ provides experts the most flexibility to choose the functions they really need.

- Statistic analysis module
- Data logger module



Main Function List

Menu Interface



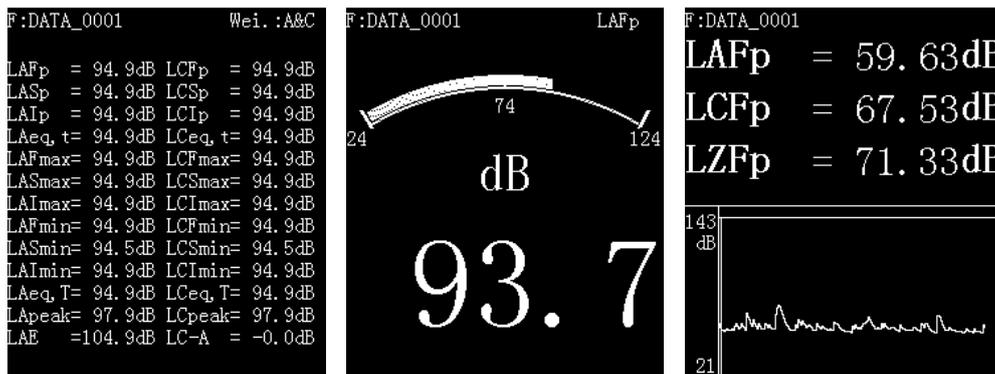
1. Integrating Function

1) Measuring Interface: $L_{xy,i}$, $L_{xy,p}$, $L_{xeq,t}$, $L_{xeq,T}$, $L_{x,max}$, $L_{x,min}$, $L_{x,peak}$ LAE, LC-A, SEL

Note: x is A,C,Z, y is F,S,I

2) Integrating time: 1s~99h59m59s, set in random

3) Measuring Interface: Simple, List, Hue, Big interface



2. Statistical Analysis Function

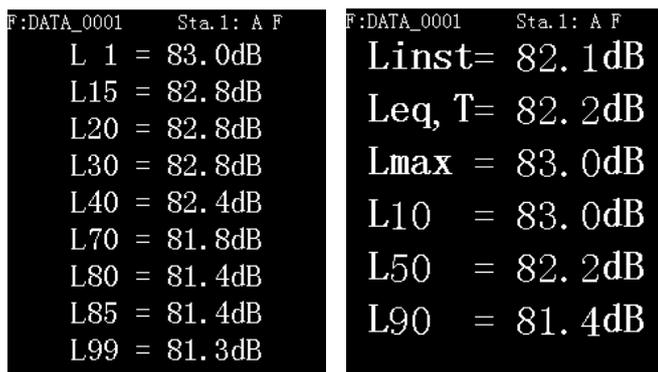
1) Main Function: The statistical analysis, 24 hours noise monitor automatically.

2) Mainly Measure Index: L_{xyp} , $L_{xeq,0.5s}$, $L_{xeq,T}$, $L_{xy,max}$, $L_{xy,min}$, $L_{xyeq,T}$, SEL, Ln as minimum: 1, 5, 10, 50, 90 with 0.1 dB resolution, SD

Note: x is A,C,Z y is F,S,I n is 1~99

24h measures index: L_d , L_n , L_{dn} .

3) Up to 28 statistical Ln % values, two statistical analyzers each has 7 preset to L1, L5, L10, L50, L90, L95 & L99 and 7 user defined Ln values. Two statistical analyzers with independent time and frequency weight.



4. GPS Positioning Function

Measure longitude, latitude, altitude, movement speed which can be recorded together with the noise measurement result.

```
F:DATA_0001 Zone:108
GPS RTC: 2015-01-26 08:00:02.00

```

	Star:	End
Lat.	30.217343N	30.217343N
Lon.	119.958458E	119.958458E
Alt.	6.3 m	7.1 m

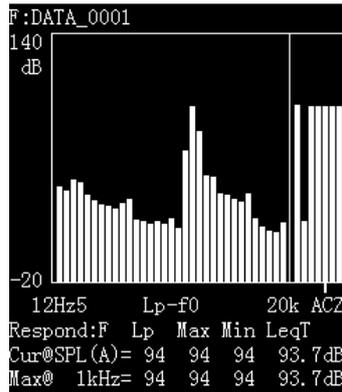
```
Distance= 0m Star Num=07
Dir.: Vel.: 0.393 km/h
Cali.@: 2015-01-26 15:52:01
```

Optional Upgrade Function List

Real-time 1/3 OCT Spectrum Function

- 1) Filter type: Parallel (simultaneous) 1/3 octave band filter, G10=103/10
- 2) Fulfills standards: IEC 61260: 1995 Class 1
- 3) Frequency bands: 33 Octave bands 12.5Hz-20kHz
- 4) Real-time Analysis Speed: 50 times/s
- 5) Measuring Interface: List interface and graph interface
- 6) Measuring Parameters: Lxyp, Lxeq,0.5s, Lxeq,T, Lxymax, Lxymin, Tm Note: x is A,C,Z,B,D, F0i y is F,S
- 7) Frequency Weighting: A, C, Z can be chosen
- 8) Level linear range: above 110dB

```
F:DATA_0001 (dB)
Respond:F Lp Max Min LeqT
SPL(Z) 93.3 94.0 88.5 92.9
SPL(C) 92.0 92.7 87.2 91.6
SPL(A) 64.1 64.8 59.4 63.8
20kHz 31.0 31.4 30.4 31.0
16kHz 42.9 43.3 40.9 42.8
12k5Hz 51.7 52.0 49.6 51.5
10kHz 29.5 29.7 28.3 29.2
8kHz 30.1 30.6 28.4 29.8
6k3Hz 28.3 29.0 27.5 28.3
5kHz 27.0 28.0 26.1 27.2
4kHz 27.0 28.0 25.3 26.9
3k15Hz 28.9 29.8 25.9 28.3
2k5Hz 29.6 30.7 26.4 29.4
2kHz 31.5 32.8 27.3 30.7
```



```
Name: DATA_0001
2017-06-06 10:15:15
1/3 OCT-INT Tm=00h00m37s
R:22dB-134dB Ts=00h00m00s Wei:Z
Model: AWA5688 Serial: 12345678
Calibrate@2013-06-06 09:57:57 Ls=-3C.9dB

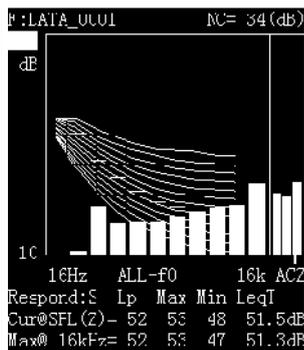
LFmax LFmin LSmax LSmin Leq T
SPL(Z) 132.2 131.5 131.9 131.9 131.5dB
SPL(C) 116.2 116.2 116.6 116.5 116.5dB
SPL(A) 83.0 81.2 82.3 82.1 82.2dB
SPL(B) 100.2 98.7 99.7 99.5 99.6dB
SPL(D) 103.2 102.6 103.0 102.9 103.0dB
SPL(T) 81.4 80.7 81.1 81.1 81.1dB
SPL(W) 124.7 124.0 124.5 124.4 124.5dB
200Hz 29.0 28.7 29.0 28.7 28.7dB
16kHz 29.9 27.7 29.0 26.7 28.6dB
12k5Hz 31.6 25.5 30.7 30.5 30.6dB
10kHz 33.0 31.8 33.1 32.8 32.8dB
8kHz 36.6 34.3 35.6 35.3 35.4dB
```

```
6k3Hz 39.1 36.9 38.2 37.9 38.1dB
5kHz 42.0 39.9 41.1 40.8 41.0dB
4kHz 44.6 42.8 44.0 43.8 43.9dB
3k15Hz 47.7 45.6 46.9 46.6 46.6dB
2k5Hz 50.7 48.7 49.9 49.7 49.8dB
1k5Hz 56.6 54.6 55.8 55.5 55.7dB
1k25Hz 59.6 57.7 58.8 58.6 58.7dB
1kHz 62.6 60.6 61.8 61.6 61.7dB
800Hz 65.6 63.6 64.8 64.5 64.6dB
630Hz 68.6 66.7 67.9 67.6 67.7dB
500Hz 71.6 69.7 70.9 70.7 70.8dB
400Hz 74.6 72.7 73.9 73.7 73.8dB
315Hz 77.6 75.7 76.9 76.7 76.8dB
250Hz 80.6 78.7 79.9 79.7 79.8dB
200Hz 83.6 81.7 82.9 82.7 82.8dB
160Hz 86.6 84.7 85.9 85.7 85.8dB
125Hz 89.6 87.7 88.9 88.7 88.8dB
100Hz 92.6 90.7 91.9 91.7 91.8dB
80Hz 95.6 93.7 94.9 94.7 94.8dB
```

Real-time 1/1 Oct Spectrum Function

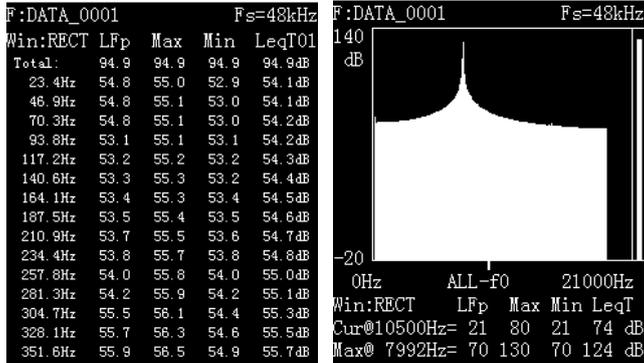
- 1) Filter type: Parallel octave band filter, G10=103/10
- 2) Fulfills standards: IEC 61260: 1995 Class 1
- 3) Frequency bands: 11 Octave bands 16Hz-16kHz
- 4) Frequency Weighting: A, C, Z can be chosen
- 5) Center Frequency: 16 Hz, 31.5 Hz, 63 Hz,125 Hz, 250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, 8 kHz, 16 kHz
- 6) Measuring Interface: List i and graph interface
- 7) Measuring Parameters: Lxyp, Lxeq,0.5s, Lxeq,T, Lxymax, Lxymin, Tm, NR Note: x is A,C, Z,F0i y is F,S
- 8) Display content: Real-time display NR & NC values and curves in the process of measuring NR according to ISO 1996:1971 NC according to ANSI S2.12-2008
- 9) Real-time Analysis Speed: 50 times/s
- 10) Level linear range: above 110dB

```
F:DATA_0001 NR= 59(dB)
Respond:F Lp Max Min LeqT
SPL(Z) 131.9 131.9 131.9 131.9
SPL(C) 120.2 120.2 120.2 120.2
SPL(A) 122.1 122.1 122.1 122.1
16kHz 131.9 131.9 131.9 131.9
8kHz 51.6 51.6 51.5 51.6
4kHz 36.7 36.7 36.0 36.3
2k5Hz 38.0 38.0 37.7 37.9
1kHz 42.6 42.6 41.9 42.3
500Hz 45.7 45.7 44.3 45.0
250Hz 24.2 24.2 23.5 23.8
125Hz 20.1 20.1 19.4 19.7
63Hz 15.2 15.2 14.7 14.9
31.5Hz 9.4 9.4 9.1 9.3
16Hz 8.8 8.8 8.1 8.4
```



Real-time FFT Analysis Function

- 1) Line Number: 2048lines
- 2) Sampling Freq: 48 kHz, 24 kHz, 12 kHz, 6 kHz, 3 kHz
- 3) Measuring Parameters: MAX, MIN, LeqT
- 4) Window Functions: hanning, brinell, flat, rectangular



SD Card & Sound Recording Function

- 1) The SD card can be used as a memory card after installing the program. Saved files can be opened in the EXCEL directly
- 2) When connected to the computer via USB interface, it changes SD card into U disk
- 3) Record Format: 8000 samples/s@8bit,
48000 samples/s@32bit
- 4) File Format: 'WAV' including calibration information
- 5) Record Time: fs=48k, record time less than 1h per file
fs=8k, record time less than 12h per file
- 6) Replay: by the meter or computer Data is captured to the SD memory card inserted in the sound level meter

Dosimeter Function

- 1) Exchange rates: Q3, Q 4,Q 5,Q 6
- 2) Fulfills standard: IEC 61252: 2002
- 3) Selectable Thresholds: 40-90dB
- 4) Selectable Criterion: 70-90dB
- 5) Lock and with limited access
- 6) Noise dose: 0.01%-999.99%
- 7) Measuring Parameters: LAsp, LASMAX, LASMIN, TWA, LEX 8h, LCpeak, LZpeak, LAeq,T, LAVG, DOSE
- 8) Logging interval: 1min
- 9) Logging content: LAVG1m LAeq1m LCpeak LZpeak LASmax LASmin

Technical Specification

Fulfills Standards	IEC 61672 Class 1 IEC 61260 Class 1 IEC61252:2002 IEC 60651:2001 Type 1 IEC 60804: 2000 Type 1 ANSI S1.4: 1983 Type 1 ANSI S1.4A:1985 Type 1 ANSI S1.43:1997 Type 1 ANSI S1.25:1991
Microphone +Preamplifier	1/2" pre-polarized condenser microphone removable preamplifier (Sensitivity Level: -28dB)
Correction Function	Diffusion field correction in order to comply with standards ANSI S1.4
Frequency Range	10 Hz ~ 20 kHz \pm 1 dB (not including microphone)
Total Measurement Range	20dB-142dB (145dB Peak)
Accuracy	\pm 0.7 dB
Self-generated Noise	<12 dB(A), 17 dB(C), 22 dB(Z)
Frequency Weighting	Parallel (simultaneous) A, C, Z, B, D and user1&2-defined weighting
Time Weighting	Parallel (simultaneous) F, S, I, Peak
A/D Bits:	24 bits
Sampling Frequency	48 kHz
Delay Time	The meter can delay 0~99s after pressing start measuring button
Back Erase Function	Elimination of undesired noise; example barking dogs, cars, doors
Display	240x320 color screen, adjustable brightness, backlight can be closed
Display Resolution	0.1 dB
Low battery indication	Symbol indicate low battery
Data Storage (32 Mb FLASH RAM. SD memory card is optional)	3328 groups of integrating measuring results only 3328 groups of statistical results only ('statistical 1' and 'statistical 2' analysis index are same.) 2663 groups of statistical results only ('statistical 1' and 'statistical 2' analysis index are different.)
Internal Clock	Error less than 1 min/month
Output Interface	AC Output (full scale): 1.0V AC RMS; Output Impedance: 1k ; Connector: 3.5 mm stereo plug DC Output: 20mV/dB; Output Impedance: 1k ; Connector: DB-9 plug "RS232 Interface: To computer for output some measurement results instantaneous values , also to mini-printer for printing Transmission speed: 4800, 9600,115200 bps USB Interface: available and no need device drive Allow USB to be controlled via communication commands
Power Supply	4xLR6 alkaline battery or rechargeable batteries 5 V external power supply
Battery Life	Longest time of 30 hours continuously with 4xLR6 alkaline battery
Dimensions	260 (H) x 80 (W) x 30 (D) mm
Weight	0.35 kg (include batteries)
EMC	Type X
Environment	Working Temperature: -10 ~ 50°C Storing Temperature: -20 ~ 70°C Relative Humidity: 25 ~ 90 %
Bluetooth Module	Wireless printing and can communicate with smart phone and realize wireless control sound level meter
GPS	Included
Recording Function	Included
Printer	Optional
Class 1 calibrator	Optional



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