V.S.W.R. & Power Meter

Instruction Manual

V.S.W.R. & Power Meter Instruction

This S.W.R. & Power meter is a highly accurate RF meter for measuring Forward Power,Reflected Power, and V.S.W.R.

Main Features:

· **O-**LED meter display for easy reading.
· Forward RF power readings, switchable to indicate either average power/peak power (SW-28HF only).
· Reflected RF power readings.
· V.S.W.R. ratios.
· Convenient control for easy operation.

MODEL NO.	SW-28 HF	SW-28 VU
Frequency Range	1.5MHz -60MHz	125MHz-525MHz

Power Range	0 - 120Watts (Maximum)
S.W.R. Range	1:1~19.99:1
V.S.W.R mesure	Power required = 1.5 Watt
DC in power	DC +5V (build-in Li-ion 3.7V 400mah)
Accuracy	S.W.R. 5 % , RF power 5%
Beep alarm	min SWR >3:1 (adj)
Input/Output Impedance	50 Ohms
Input/Output Connectors	SO-239
Size (include connector)	88(W) x 40 (H) x 80 (D)
Weight	175g
Accessories	Instruction Manual , Type-C charger cable

Explanation of Features:

1. Power Switch.
2. 0.96" O-LED Display.
3. Menu.
4. Peak/Avg or Enter (SW-28HF) / Enter (SW-28VU)
5. Charger LED
6. 5V Charger in : Type -C.
7. ANT Connector : Coax connector to 50 ohm antenna system.
8. TX Connector : Coax connector to transmitter 50 ohm RF output.
9. Model No.Detail & Work Frequency Range.

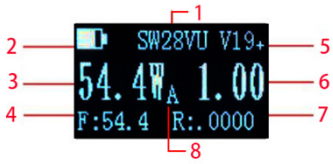
Note: that the front and rear panel data of the two models are different.Subject to change without prior notice

SW-28HF explanation of display menu

1. Model No.
2. Battery Level
3. Forward watt data
4. Forward watt data
5. Version No.
6. S.W.R.data
7. Reflected watt

Menu:

1. MODE: Power on by Avg. /Peak
2. BEEP : ON/OFF
3. AUTORESET : OFF ~30sec.
4. EXIT
5. SAVE & EXIT



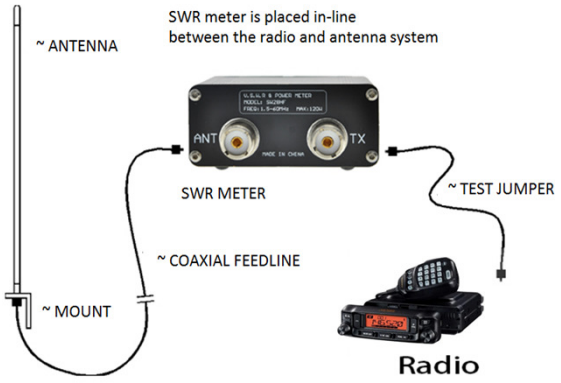
SW-28 VU explanation of display menu

1. Model No.
2. Battery Level
3. Forward watt data
4. Forward watt data
5. Version No.
6. S.W.R.data
7. Reflected watt
8. A(analog) ,D(DMR)

Menu:

1. BEEP : OFF / SWR> 3~9
2. AUTORESET : OFF ~ 15 sec.
3. ADJ. WATT : + - 99 (long press Enter for + -)
4. EXIT

THE SET UP



How to Use :

The S.W.R.meter is connected between the radio (TX) and the antenna, as close as possible to the transceiver (use a cable of max. 40 cm like Test Jumper. (Not include)

1)Check all connections.
2)Press the key of the microphone PTT to pass into transmission and keep it in this position.
3)Read data of S.W.R. / Forward watt / Reflected watt

What is a high SWR reading?

1.5 -> 2.0. Your antenna is acceptably tuned and should work fine.
2.0 -> 3.0. Your SWR reading is slightly high, it shouldn't damage your radio but you should try and tune your antenna to bring down your SWR reading.
Above 3.0 or more . Your antenna isn't tuned acceptably and could damage your radio.

CAUTION

1. Since the meter is very sensitive, avoid excessive vibration or mechanical shock to the unit.
2. The absolute maximumpower that should be applied to the meter is 120W.
3. The transceiver and antenna connections to the meter must never be reversed.Always observe the correct connections to the transmitter and the antenna .
4. The meter has been carefully calibrated at the factory. Tampering with any of the internal circuitry or sensors may cause damage and will degrade the accuracy of the meter.

. Do not expose the meter to excessive temperatures, high humidity, or strong magnetic fields.

Understanding S.W.R. Meters

An SWR (Standing Wave Ratio) meter is an instrument used to measure the amount of reflected power (power coming back from the antenna and/or transmission cable) to the transmitter. For a transmitter to provide all the power to an antenna, the antenna needs to be resonant and the transmission cable (coax) has to introduce minimum loss. In a perfect scenario, in an efficient antenna system, all the power outputted from the transmitter makes it into the atmosphere. Both the coax and the antenna, if not tuned right will induce losses. These losses will not make it out to the air but come back to the transmitter in the form of "standing waves".

SWR is the ratio of the forward power vs the reflected power. A perfect antenna system will show 100% forward power and 0% reflected power and is referred to as 1.0:1 which is hard to maintain.

Typically a 1.1:1 is ideal and 1.2:1 is average.

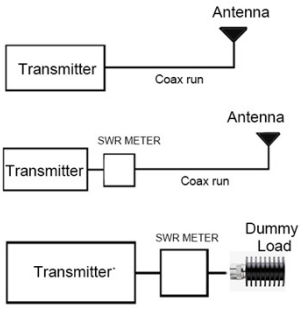
Anything over 3.0:1 is suspect and needs troubleshooting or tuning.

3:1 is unacceptable and could damage the transmitter if it doesn't have reflected power protection (foldback) circuitry.

a1.0:1 is 100% efficiency to the atmosphere.

a1.1:1 is 0.2366% loss, a 1.2:1 is 0.826% loss,

a1.5:1 is 4% loss, and a 2:1 is 11.1% loss of power.



Unfortunately you cannot tell if a problem is in the antenna or coax (transmission line) if it is placed at the output of the transmitter shown above.

Placing the SWR meter at the output of the transmitter may not necessarily show accurate reflected power since losses in the coax can show up as a decrease in reflected power. Also if there is high SWR, it can show a high false reading of output power from the transmitter.

To accurately measure output power of transmitter you must place the S.W.R. meter between a good 50 ohm purely resistive "dummy" load and the transmitter as shown below. Accurately note the power out first. Be aware that some SWR meters cannot accurately measure power output. Just relative output for indicating reflected power.

The SWR meter should then be placed between the end of the coax run with a dummy load as shown below.

驻波比 & 功率计

使用说明书

驻波比/功率计使用说明

这个 驻波比 & 功率计是一款高精度射频计，用于测量正向功率、反射功率和 驻波比

主要特点：

- O-LED 显示，方便阅读数据
- 正向射频功率读数，可切换以指示平均/峰值功率(SW28HF仅有)
- 反射射频功率读数
- 驻波比驻波比
- 控制方便，操作简单

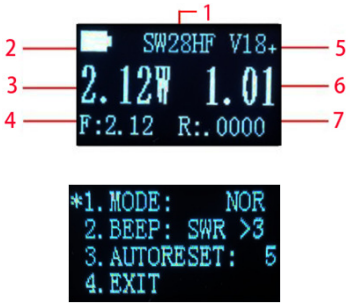
型号	SW-28 HF	SW-28 VU
频率范围	1.5MHz -60MHz	125MHz-525MHz

功率范围	0 - 120瓦特 (最大功率)
驻波比范围	1:1~19.99:1
驻波比测量	所需瓦特 = 1.5 瓦特
直流电源输入	DC+5V (内置锂离子电池3.7V 400Mah)
准确性	驻波比 5 % ，功率5%
蜂鸣报警	驻波比 大於 3:1 或以上 (可調)
输入/输出阻抗	50 歐姆
输入/输出连接器	SO-239
尺寸（包括连接器）	88(W) x 40 (H) x 80 (D)
重量	175g
配件	使用说明书、Type-C充电线

注：两款机型(SW-28HF/SW-28VU) 前后面板数据展示不同。 如有更改，恕不另行通知

功能说明：

1. 电源开关
2. 0.96" OLED 显示屏 工作
3. 菜单
4. 峰值/平均值读数或输入 (SW-28HF仅有的)、输入 (SW-28VU仅有的)
5. 充电器 LED
6. Type-C 5V 充电
7. ANT 连接器：连接 50 欧姆天线系统的同轴连接器
8. TX 连接器：连接发射器 50 欧姆 RF 输出的同轴连接器
9. 型号和工作频率范围

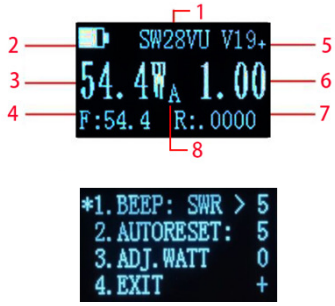


SW-28HF 显示说明

1. 型号
2. 电池电量
3. 正向功率
4. 正向功率
5. 版本
6. 驻波比
7. 反射功率

菜单：

1. 开机模式：正常/ 峰值
2. 蜂鸣声：关闭/驻波比 多于 3:1~9:1
3. 测量自动重置：关 ~30 秒。
4. 退出
5. 保存并退出



SW-28 VU 显示说明

1. 型号
2. 电池电量
3. 前向功率
4. 前向功率
5. 版本
6. 驻波比
7. 反射功率数
8. A(模拟体系),D 数字体系(DMR)

菜单：

1. 蜂鸣声：关闭/驻波比 多于 3:1~9:1
2. 测量自动重置：关闭~ 15 秒。
3. 功率调整 : + - 99（长按 Enter 为 + - 调整 ）
4. 退出
5. 保存并退出

设置

如何使用：

S.W.R. 计连接在无线电 (TX) 和天线之间，尽可能靠近收发器
使用最长 40 厘米的电缆，如测试跳线(不包括)。

1) 检查所有连接。
2）按麦克风之PTT键进入发射状态并保持在此位置。
3）仪表显示驻波比 / 正向功率瓦特 / 反射功率瓦特数据。

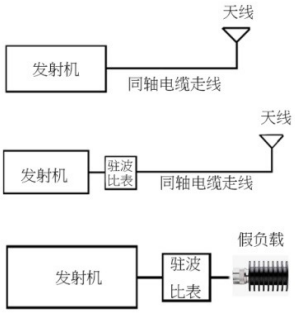
什么是高 S.W.R. 驻波读数？1.5 -> 3.0：

1.5~2.0 您的天线已调整到可以接受的程度并且应该可以正常工作。
2.0~3.0 您的 SWR 读数稍高，不会损坏您的对讲机.
但您应该尝试调整天线以降低 SWR 读数。
高于 3.0 或更高 您的天线调谐不正确，可能会损坏您的收发器。

注意

1. 由于仪表非常敏感，请避免设备过度振动或机械冲击。
2. 施加到仪表上的绝对最大功率为 120W。
3. 收发器和天线与仪表的连接绝对不能颠倒。始终遵守发射器和天线的正确连接。
4. 仪表在出厂时已经过仔细校准。 篡改任何内部电路或传感器都可能造成损坏并降低仪表的精度。

请勿将仪表暴露在过高的温度、高湿度或强磁场的环境中。 了解驻波比表SWR（驻波比）计是一种用于测量发射机反射功率（从天线和/或传输电缆返回的功率）的仪器。 为了使发射机向天线提供所有功率，天线需要谐振，并且传输电缆（同轴电缆）必须引入最小的损耗。 在完美的情况下，在高效的天线系统中，发射机输出的所有功率都会进入大气中。 如果调谐不当，同轴电缆和天线都会产生损耗。 这些损耗不会传播到空气中，而是以“驻波”的形式返回发射器。SWR 是正向功率与反射功率之比。 完美的天线系统将显示 100% 的前向功率和 0% 的反射功率，称为 1.0:1，这是很难维持的。 通常，1.1:1 是理想的，1.2:1 是平均的。
任何超过 3.0 :1 的值都是可疑的，需要进行故障排除或调整。
3:1 是不可接受的，如果发射器没有反射功率保护（折返）电路，则可能会损坏发射器。 1.0:1 表示对大气的效率为 100%。
1.1:1 为 0.2366% 损耗，1.2:1 为 0.826% 损耗，
1.5:1 为 4% 损耗，2:1 为 11.1% 损耗。



不幸的是，如果问题出现在上面所示的发射器的输出处，您无法判断问题是否出在天线或同轴电缆（传输线）中。

驻波比测量:

将 SWR 计放置在发射机的输出端可能不一定会显示准确的反射功率，因为同轴电缆中的损耗可能会表现为反射功率的降低。 此外，如果 SWR 较高，则可能会显示发射机输出功率的较高错误读数。要准确测量发射机的输出功率，您必须将 SWR 计放置在良好的 50 欧姆纯电阻“虚拟”负载和发射机之间，如下所示。 首先准确记下电源。 请注意，某些 SWR 仪表无法准确测量功率输出。 只是用于指示反射功率的相对输出。

功率测量

然后，应将 SWR 计放置在带有假负载的同轴电缆末端之间，如下所示。