

MFJ-819

MOBILE SWR/WATTMETER

INSTRUCTION MANUAL

PLEASE READ THIS MANUAL BEFORE OPERATING THIS EQUIPEMENT!

MFJ ENTERPRISES

300 INDUSTRIAL PARK
STARKVILLE, MS 39759 USA
www.mfjenterprises.com
662-323-5869

OPERATION

The **MFJ-819** SWR/Wattmeter's unique two-unit design, with a control unit and a remote sensor, permits convenient "remote" placement of the sensor in both mobile and home stations.

The **MFJ-819's** cross needle meter displays peak or average FORWARD power, peak or average REFLECTED power, and SWR, all simultaneously. The control unit's **REF IND (Reflected Indicator)** is a warning lamp for low and high-power operation; the lamp illuminates when a factory setting of 2:1 VSWR is reached. To change the factory default see ADJUSTING REF IND.

A 12 volt DC power source is required for the meter to function. An external 12 VDC source can be provided via a jack on the sensor unit, or a 9 VDC battery can be installed inside the control unit. When an external power source is used the unit is enabled at all times and comes on when RF is sensed. When battery power is used, the battery is connected by the PWR ON/OFF pushbutton. Under battery power, the meter lamp and **REF IND** indicator lamp do not function, to conserve battery life.

Full scale forward and reflected power range is selected by the **RANGE HIGH/LOW** pushbutton. If your transmitter runs more than 300 watts of peak output power, set this switch to the 3000 watt, **HI** position (in). If your transmitter runs less than 300 watts peak output power, set the push button to the 300 watt, **LOW** position (out). Peak envelope power (PEP) is measured by placing the **PEAK/AVG** switch in the "in" position.

Peak and average power values are equal with steady unmodulated carriers such as closed-key CW, RTTY, FSK, or FM. The meter reading on these modes will be the same in either peak or average modes. On SSB, the ratio of PEP to average power varies with different voice and modulation characteristics. With most voices the PEP reading is three to five times higher than the average voice power reading.

The left hand FORWARD meter scale displays forward power in a scale from 0 to 300 watts. In the LO power position the reading is directly. Each picket (scale mark) represents 5 watts below 10 watts, 10 watts between 10 and 100 watts, and 25 watts between 100 and 300 watts. In the HIGH power position, multiply the meter reading by ten

Power readings are most accurate over the upper half of the meter scales. When measuring power with less than a perfect match, subtract reflected power from forward power to measure the true power.

SWR is read directly from nine red SWR curves that range from 1:1 to infinity. SWR is indicated at the point where the forward and reflected meter pointers cross. The SWR is indicated by the red curve closest to the pointer crossing point. No cumbersome SWR sensitivity adjustments are required with this meter.

The power meter is backlit with an internal lamp only when using non-battery power. The 12 Vdc jack on the sensor unit accepts a 2.1 mm coaxial plug with the center conductor positive and the sleeve negative, for powering both the meter lamp and the control unit circuitry. The control unit and sensor are connected by a 25 foot length of flexible cable (supplied), terminated at both ends in telephone-style RJ-45 plugs.

INSTALLATION

1. A power source must be connected for the power meter to operate. There are two choices:
 - a. Connect a 12 Vdc power source to the back of the sensor marked 12 Vdc. This method will supply power to the meter lamp and REF IND. The power switch operates the meter lamp. The meter circuit will still work with the switch in the off position.
 - b. Remove the back cover of the meter box and connect a standard 9 volt battery to the battery snap. Place the battery into the metal holder, and replace the cover. When a 9 volt battery is used as the only power source, the meter lamp and REF IND will not function. The power switch switches the internal battery on/off.
2. Locate the wattmeter and sensor in a convenient location.
3. Connect the Sensor box to the operating station with good quality coax.
4. Use the supplied patch cable and connect the sensor to the meter box.

ADJUSTING REF IND

The REF IND can be adjusted to come on between 1.3:1 to 6:1 VSWR (factory setting is 2:1 VSWR)

There are two different ways to make this adjustment:

Option 1: Change the indicator setting with a digital DC volt meter.

1. Connect the **MFJ-819** to a 50 ohm load. (see installation if needed)
2. Remove the back cover of the control unit.
3. Place Range positions to LOW and AVG.

Note: A digital DC volt meter will be needed for the following steps.

4. Refer to Figure 1. Apply enough RF to indicate 100 watts on the forward meter scale and measure the voltage at **TP1** (nominal .9 volts). Make a note of this voltage. Voltage A

Note: Raising the voltage at TP1 will make the indicator come on at a higher VSWR. Lowering the voltage at TP1 will make the indicator come on at a lower VSWR.

The follow chart will tell how much to raise or lower the voltage measured in step 4 by adjusting VR102. (Figure 1)

example. Let say the voltage in step 4 was 1.0 volt. To make the REF IND come on at 1.5:1 VSWR then the voltage should be adjusted .3 volts less than 1.0 (voltage A) = .7 volts.

0.6 volts more than	voltage A	=	2.5:1 VSWR
	voltage A	=	2:1 VSWR
0.3 volts less than	voltage A	=	1.5:1 VSWR
0.6 volts less than	voltage A	=	1.3:1 VSWR

Option 2: Tuning an antenna tuner to the desired VSWR..

1. Connect the **MFJ-819's** Transmitter connector to the transceiver's RF OUT (antenna) connector.
2. Connect the **MFJ-819's** antenna connector to the input of the antenna tuner.
3. Connect power and patch cable to **MFJ-819** (see installation).
4. Connect the antenna tuner to a dummy load or antenna.
5. Remove the back cover of the control unit and locate VR102 (refer to Figure 1).

6. Apply 10 to 100 watts of RF and adjust the antenna tuner to the VSWR that you want the light to come on.
7. While transmitting adjust VR102 until the light goes off then back to where the light just comes on.
8. Replace the cover and resume normal operating.

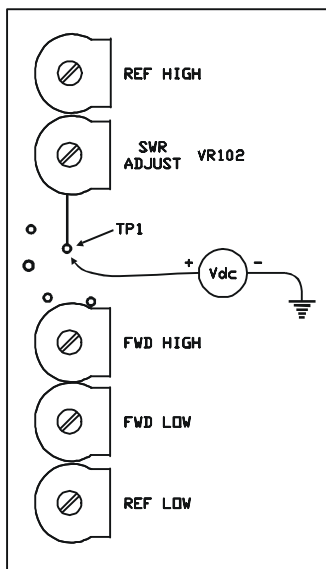


Figure 1

TECHNICAL ASSISTANCE

If you have any problem with this unit first check the appropriate section of this manual. If the manual does not reference your problem or your problem is not solved by reading the manual, you may call **MFJ at 662-323-5869**. You will be best helped if you have your unit, manual and all information on your station handy so you can answer any questions the technicians may ask.

You can also send questions by mail to MFJ INC., 300 Industrial Park, Starkville, MS 39759; by Facsimile (FAX) to 662-323-6551, or email to mfjcustserv@mfjenterprises.com. Send a complete description of your problem, an explanation of exactly how you are using your unit, and a complete description of your station.

