

TW-1

Talking Wattmeter

LDG
Electronics

LDG Electronics

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Introduction

LDG is a family owned and operated company that pioneered the automatic, wide-range switched-L tuner in 1995. From its laboratories in St. Leonard, Maryland LDG continues to define the state of the art in this field with innovative automatic tuners and related products for every amateur need.

Congratulations on selecting the LDG TW-1 talking wattmeter. The TW-1 provides accurate RF power and SWR readings aurally, by synthesized voice over a self-contained speaker. It is ideal for situations when you need to watch something else while making an adjustment, or for visually impaired hams.

The TW-1 speaks the power level audibly. It is ideal for visually impaired hams.

Important Safety Warning

Never install antennas or transmission lines over or near power lines. You can be seriously injured or killed if any part of the antenna, support or transmission line touches a power line. Always follow this antenna safety rule: the distance to the nearest power line should be at least twice the length of the longest antenna, transmission line or support dimension.

Keep antennas, supports and transmission lines well away from overhead power lines.

Quickstart Guide

You should really read the whole manual, but this summary will get you started.

- Attach the RF input jack (right connector when viewed from back) to your transmitter or transceiver with a 50 ohm coaxial jumper cable.
- Attach your antenna to the RF output (left connector when viewed from back).
- Connect a 12 volt power supply capable of delivering 200 ma to the 2.5 x 5.5 mm coaxial power jack (center positive).
- Set the volume to the mid-point.
- While transmitting RF, press and release the left-hand FWD button. The unit will speak the forward power level. Adjust the volume to the desired level.
- While transmitting RF, press and release the center REV button. The unit will speak the reverse power level.
- While transmitting RF, press and release the right-hand SWR button. The unit will speak the SWR.
- The unit will turn itself off after use.

Specifications

Always operate within these limits.

- 0 - 2,000 watts, auto-ranging
- +/- 5% accuracy (10% on 6 meters)
- Adjustable volume
- Verbose or terse speech
- Tone mode for continuous feedback
- Speaks in English, Spanish or German
- Size: 5 x 4.5 x 3 inches
- Built-in speaker
- Requires 12 volts at 200 ma, 2.5 x 5.5 mm jack, center positive
- Auto power on and off

Getting to know your TW-1

You'll be using your TW-1 for a long time; take a few minutes to get to know it.

Your TW-1 is a quality, precision instrument that will give you many years of outstanding service; take a few minutes to get to know it.

On the front panel, there is a volume knob and three pushbuttons: FWD, REV and SWR. On the rear panel, there are two SO-239 RF connectors, and a 2.5 x 5.5 mm jack coaxial DC power connector. A self-contained speaker is on the top.

Front Panel

The three buttons initiate speech readout.

On the front panel there three pushbuttons and one knob.

- **Volume Knob:** Adjusts the volume of the spoken power and SWR levels.
- **FWD:** Initiates speech of the forward power level.
- **REV:** Initiates speech of the reverse power level.
- **SWR:** Initiates speech of the standing wave ratio.



Rear Panel

The rear panel has standard SO-239 sockets for RF input and output, and a power socket.

The rear panel of the TW-1 features three connectors:

- **Radio:** Connects to the radio's antenna port.
- **Antenna:** Connects to the antenna
- **12 VDC:** Connects to a source of 12 volt DC capable of supplying at least 200 milliamps. The center pin of the socket is positive.



Your TW-1 is not water resistant; keep it dry.

Turn your radio off before you install the TW-1.

Options are selected by pressing and holding front panel buttons.

Terse mode saves time.

Installation

The TW-1 is intended for indoor use only; it is not water resistant. If you use it outdoors (Field Day, for example) you must protect it from rain.

Position your TW-1 in a convenient spot on your operating desk, as close to your transceiver or transmitter as practical. Do not place any other item on top of it; the speaker is on the top of the unit. Connect the **Radio** jack to your transceiver or transmitter's antenna port with a 50 ohm coaxial jumper of suitable power handling capacity. Connect the **Antenna** jack to your tuner or antenna.

Your TW-1 requires 12 volts DC at 200 ma. Connect a suitable power supply to the 2.5 x 5.5 mm coaxial DC input jack using the provided 2.5 x 5.5 mm jack coaxial power connector (center positive). A regulated power supply is recommended, but is not required. Caution: High RF voltages may be present on internal components when transmitting. Never operate your TW-1 with the cover removed.

Always turn your radio off before plugging or unplugging anything. The radio may be damaged if cables are connected or disconnected while the power is on.

Setup

Setup options are selected by pressing and holding buttons or combinations of buttons while you apply DC power. The simplest way to apply power for setup is to unplug the DC power plug, wait 10 seconds, then re-insert the DC power plug from the back of the TW-1, but you could also turn the DC power supply off then on again. Setup options are retained indefinitely, even if DC power is removed.

Language

Your TW-1 will speak in English, Spanish or German; the default is English. To set the language, press and hold a button while connecting DC power:

- FWD Button (Left): English
- REV Button (Center): Spanish
- SWR Button (Right): German

Speech mode

Your TW-1 will speak in one of two different modes: Verbose and Terse. In Verbose mode, the TW-1 speaks in full sentences, as in "The forward power is ninety seven watts". In Terse mode, only the numerical value is spoken, as in "ninety seven". The default is verbose mode. After you become accustomed to your TW-1, you will likely

want the shorter readouts, without all the extra chit-chat. To select "Terse" mode, press the REV and SWR (center and right) buttons together while you apply DC power. Thereafter on pressing a button when RF is present, only the numerical value will be spoken.

To return to "Verbose" mode, press the FWD and REV buttons (left and center) together while you apply DC power.

Operation

Speech Operation

Spoken measurements are available on demand; the measurement is spoken on button release. With RF present, press and release a button to produce the following spoken formats:

- FWD Button: forward RF power
 - (Verbose mode example: "The forward power is ninety seven watts")
 - (Terse mode example: "ninety seven")
- REV Button: reverse RF power
 - (Verbose mode example: "The reverse power is three watts")
 - (Terse mode example: "three")
- SWR Button: SWR
 - (Verbose mode example: "The SWR is two point one")
 - (Terse mode example: "two point one")

Your TW-1 works best with a constant RF carrier. Using a voice mode (SSB for instance) would require you to talk on the radio and listen to the meter at the same time. Select CW, AM or FM mode for a constant carrier, always observing the power limitations listed in Specification.

Tone Operation:

When adjusting a manual tuner, vacuum tube transmitter or amplifier, it is often desirable to have a continuous measurement of power or SWR. Your TW-1 provides this by playing a tone whose pitch goes up and down with the power or SWR.

To place your TW-1 in Tone mode, press and hold any of the three buttons for more than three seconds before applying RF. The TW-1 will beep to indicate it has changed to Tone mode; release the button when you hear the beep. When you apply RF, the TW-1 will emit a continuous tone whose pitch is proportional to the power; the higher the power, the higher the pitch. You can select either Forward (FWD Button) or Reverse (REV Button) power for tone readout.

To hear the spoken power level simply press and release a button

Tone mode is good for manually adjusting a tuner or amplifier.

A pulsing tone indicates excessive SWR above 3:1

You can also select SWR for tone readout, as above (SWR Button). The pitch of the tone is proportional to the SWR; the higher the SWR, the higher the tone. If the SWR is above about 3:1, the tone will pulse to indicate that the SWR is excessive.

After 30 seconds with no RF present, the TW-1 automatically reverts to Speech mode (verbose or terse, whichever you have set). You can also manually reset it to Speech mode by pressing and releasing any of the buttons. The TW-1 will beep to indicate that it has returned to Speech mode.

Button Summary

	Press and Release (RF Present)	Press and Hold 3 sec	Press and Hold On Power-Up
FWD Button ● ○ ○	Forward Power	Forward Power Tone Mode	English
REV Button ○ ● ○	Reverse Power	Reverse Power Tone Mode	Spanish
SWR Button ○ ○ ●	SWR	SWR Tone Mode	German
REV + SWR ○ ● ●	–	–	Terse Mode
FWD + REV ● ● ○	–	–	Verbose Mode

Button Summary

Application Notes

Here are some helpful notes on using your TW-1.

The TW-1 is primarily intended for visually impaired hams, and those of us more "experienced" hams who must resort to bifocals, making small meters hard to see at any distance. The TW-1 is also very useful for special situations when you need to "watch" more than one meter, as when you are tuning the output stage of a vacuum tube transmitter or amplifier. With your TW-1 in Tone mode, you can easily watch the plate current meter on the transmitter or amplifier while listening to the power output on your TW-1 in Tone mode.

The TW-1 is suitable for mobile use. Simply install it in a convenient location near your operating position, and provide 12 volts DC through a fused line (fuse not included; LDG recommends a 2 amp fast-blow fuse). SWR Tone mode is especially useful for tuning a "screwdriver" antenna while watching the road. LDG strongly recommends that you pull over to a complete stop before adjusting your antenna, but we realize that not everyone does this; you know who you are.

A Word About Etiquette

Be careful not to interfere with other stations when you tune.

When tuning a transmitter or amplifier using your TW-1, be sure to use a vacant frequency. With today's crowded ham bands this is often difficult. However, causing interference to other hams should be avoided whenever possible.

Care and Maintenance

The TW-1 is essentially maintenance-free. You should always strictly observe the power limits specified in this manual. The outer case may be cleaned as needed with a soft cloth slightly dampened with household cleaning solution. As with any modern electronic device, the TW-1 can be damaged by temperature extremes, water, impact, or static discharge. LDG strongly recommends using a good quality, properly installed lightning arrestor in the antenna lead.

Technical Support

Email or call if you have questions or need help.

Technical support is always available by e-mail (support@ldgelectronics.com) or phone (410-586-2177). We've also placed answers to common questions in the FAQ section of our web page. LDG also keeps up to date product information on our web site, including product manuals if you need a replacement. When you consider buying another LDG product, our website has complete specifications and photographs you can use to help make your purchase decision. There are also links to all of the quality LDG Dealers who are ready to help you make your purchase decision.

Two-Year Transferrable Warranty

Your two-year warranty is transferable if you sell or give your TW-1 to someone else.

Your LDG product is warranted against manufacturer defects in parts and labor for two full years from the date of purchase. This two-year warranty is transferable; when you sell or give away your LDG product include the original sales receipt, and the two-year warranty goes with the product to the new owner. There is no need to complete a warranty card or to register an LDG product; your receipt establishes eligibility for warranty service, so be sure to save it. Include a copy of your receipt whenever you send your product to LDG for warranty repair. Products sent to LDG without a receipt are considered requests for out-of-warranty repair. The warranty does not cover damage or abuse; a failure caused by the customer or by an act of nature (e.g. lightning), as determined by LDG, is not covered under the two-year warranty. Damage can be caused by failure to observe the product's published limitations and specifications, or by not following good Amateur practice.

We'll be happy to fix your TW-1 even if it's out of warranty.

Pack it carefully, include your receipt for warranty service, and ship it to us; no RMA is required.

We love to hear from our customers.

Out of Warranty Service

LDG will repair your product even after the warranty has expired; a reasonable fee will apply. We will troubleshoot the problem, and based on your instructions either contact you with an estimate, or fix it and bill you for any repair charges. Check our web site for the latest information on obtaining out of warranty service.

Returning Your Product For Service

LDG does not require a return merchandise authorization, and there is no need to contact LDG before returning your product. Download the LDG Product Repair Form from our web site. On the Repair Form, describe the problems you're experiencing. Our technician will attempt to duplicate the problems that are describe, so please be accurate and complete. LDG recommends using a shipper that provides a tracking number. Include your email address so our return shipper can alert you when your product is en-route back to you. Repairs can take six to eight weeks, but are often faster. The most current information on returning products for service is found on the LDG website under the Support menu item, then under the Tech Support sub-menu.

Send your carefully packaged unit with the Repair Form and a copy of your receipt to:

LDG Electronics, Inc.
Attn: Repair Department
1445 Parran Rd
St. Leonard, MD 20685

Product Feedback

We encourage product feedback; tell us what you think of your LDG product. In a card, letter, or email (preferred) tell us how you used the product, how well it worked in your application, and any suggestions you have for enhancements or new products. Send along a photo or even a schematic or drawing to illustrate your narrative. We like to share your comments with our staff, our dealers, and even other customers on the LDG website:

<http://www.ldgelectronics.com/>

