

LDG Electronics

Z-100A Antenna Tuner

For HF transceivers

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Welcome

Welcome to the LDG Electronics family of amateur radio equipment! Starting in 1995 and based in St. Leonard, Maryland, LDG defines state of the art tuners and related equipment for the amateur (“ham”) radio community.

In addition to offering established equipment we’re also continuing to grow our product line. Feel free to check our web site (<https://ldgelectronics.com/>) often to learn about new developments! We also offer complete product support through our web site, and we’re here for you for any questions that you might have. All of our products are supported with a two-year transferrable warranty. When you sell your LDG product provide the new owner with a copy of the original sales receipt and the two-year warranty transfers to the new owner.

There is no need to complete a warranty card or to register our products. Your product receipt establishes eligibility for warranty service; save that receipt! Send your receipt with the product when you ship your product to us for repair. Products sent to LDG without a receipt are considered requests for out-of-warranty repair.

LDG does not warranty against product damage or abuse. This means that a product failure, as determined by LDG, to be caused by the customer or by other natural calamity (e.g. lightning) is not covered under the two-year warranty. Damage can be caused by failure to heed the product’s published limitations and specifications or by not following good Amateur practice.

OUT OF WARRANTY SERVICE

We will gladly provide service any time a product fails after the warranty. Send the product to us for repair. We will determine what needs to be done, and, based on your prior instruction, either contact you with an estimate or fix it and contact you with a request to pay any repair charges. Please contact LDG with any questions before you send us an out-of-warranty product for repair.

RETURNING YOUR PRODUCT FOR SERVICE

Returning a product to LDG is easy. We do not require a return merchandise authorization, and there is no need to contact LDG to return your product. Visit the Customer Support Center on our web site and download the LDG Product Repair Form. On the Repair Form tell us exactly what happened (or didn’t happen) and why you believe the product needs servicing. The technician will attempt to duplicate the problem(s) you had based on how well you describe it so please be accurate and complete.

Ask your shipper for a tracking number or delivery verification. Please include your email address so our shipper can alert you when your product is being returned to you. Periodic updates on the status of the repair are not available. We can only indicate the repair is in process until it ships back to you. Please be assured that our staff makes every effort to complete repairs ahead of our published wait time. Your patience is appreciated.

Repairs can take six to eight weeks, but are usually faster. The most recent information is found at the LDG Customer Support Center. Send your carefully packaged unit with the Repair Form 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 use the product and how well it worked in your application. 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 at the LDG website.

Introducing the Z-100A Automatic Tuner

The Z-100A automatic antenna tuner is similar to other LDG tuners you may already be familiar with; it is a precision instrument that will provide many years of quality service.

What makes this tuner different is that it is specifically designed for Icom line of transceivers. With ease-of-operation in mind, this tuner is powered directly by the interface on the back of the radio; no need to worry about any additional power connections. Also a single push button switch is all that's needed to complete the tuning process!

The Z-100A also features low power consumption since it uses latching relays which require no power once it's tuned.

Before actual use, we urge the user to read the entire manual to ensure safe operation and long life of the Z-100A. With proper care this tuner will provide many hours of enjoyable operation.

Installing and Connecting the Z-100A tuner

The Z-100A tuner is designed for indoor operation only; it is not weather proof / water resistant. If you use it outdoors (Field Day, for example), ensure it is properly protected from rain, dust, etc.

The Z-100A is designed for use with coax-fed antennas. If operating with long-wire or ladder-line-fed antennas, an external balun is required. The LDG RBA-4:1 or RBA-1:1 is ideal, depending on the antenna and transmission line used.

1. Make sure your Icom radio is turned off.
2. Connect the HF/50 MHz antenna jack on the transceiver to the “TX” jack on the Z-100A, using the supplied 50Ω jumper.
3. Connect a 50Ω coax antenna feedline to the “ANT” jack on the Z-100A.
4. Connect one end of the supplied radio interface cable to the tuner port on the back of your radio.
5. Connect the other end of the supplied radio interface cable to the “Radio” jack on the rear of the Z-100A.
6. Turn on the radio.
7. Select the desired operating frequency and mode.
8. Push and hold the **TUNER/CALL** button on the front of the radio for one second (until the **Tuning** LED comes on), then release. The transceiver will automatically key up with a minimal amount of power, and the Z-100A begins its’ tuning cycle. At the end of this tuning cycle, the original mode and power level is restored.
9. You’re now ready to operate!

Most of the time the Z-100A’s memory tuning will allow a good match to be found quickly if transmitting on the same frequency as a previously stored match. Under certain circumstances, especially when using a different antenna, the memory tuning will recall a previous match which is acceptable, but isn’t the best match possible for this situation. In this case, forcing a full tune will cause the Z-100A to seek a better match than the match already stored in memory.

To force a full tuning cycle press and hold the **Tune** button on the front panel of the Z-100A until the **Tuning/Status LED** lights up, and continue holding until the **Tuning/Status LED** goes out. The **Tune** button can be released once the **Tuning/Status LED** has gone out. A full

tuning cycle will begin. When tuning is complete, the transceiver will be restored to its previous operating mode and power level.

The **SWR LED** and **Tuning LED** are used to indicate both operating modes, tuning status, and error codes.

The following table lists the LED status codes and their meaning.

LED Indication	Meaning
Tuning LED on.	Tuner is tuning.
Tuning LED goes out, SWR LED comes on solid.	Tuner has completed a tuning cycle; a good SWR match was found.
Tuning LED goes out, SWR LED blinks 5 times.	Tuning cycle is complete, tuning match is between 1.5:1 and 3.0:1 SWR.
Tuning LED goes out, no SWR LED.	Tuning cycle is complete, tuning match is greater than 3.0:1 SWR.
Tuning LED blinks 4 times.	Tuning cycle failed, no RF was detected.
Tuning LED blinks 5 times.	Tuning cycle failed, RF was lost in the middle of the tune.

Specifications & Ratings

To ensure proper operation and to avoid equipment failure, the following specifications and ratings must be observed:

Frequency Range: 1.8 to 54 MHz

Maximum Input Power: 125W PEP (CW / SSB / AM), 30W (Digital / RTTY / FM)

Input Impedance: 50 Ω

Tuning Range: 10:1 SWR

Memories: 2000

Retune Time: < 1.0 s.

Voltage: 13.8 VDC $\pm$ 15%

Current Draw: 500 mA tuning, 20 mA idle

Size: 6.3"x6.3"x1.5" (160x160x40mm)

Weight: 1.5 lbs (680 g)

Compatible Transceivers

The Z-100A is designed to be used with any Icom 100-watt transceiver that supports the AH-3 or AH-4 Icom antenna tuners. Currently, this includes:

IC-706

IC-718 (select AH-4)

IC-746

IC-7000

NOTE: If using with an IC-718 select AH-4 mode. See the IC-718 owner's manual for details.

The radio interface cable supplied is 14" long. If the Z-100A is positioned farther from the transceiver, a custom cable can be constructed. This can be accomplished in two ways: Cut the supplied cable and solder a jumper wire between all the connections, or purchase new connectors and cable to construct a custom-length interface cable from scratch.

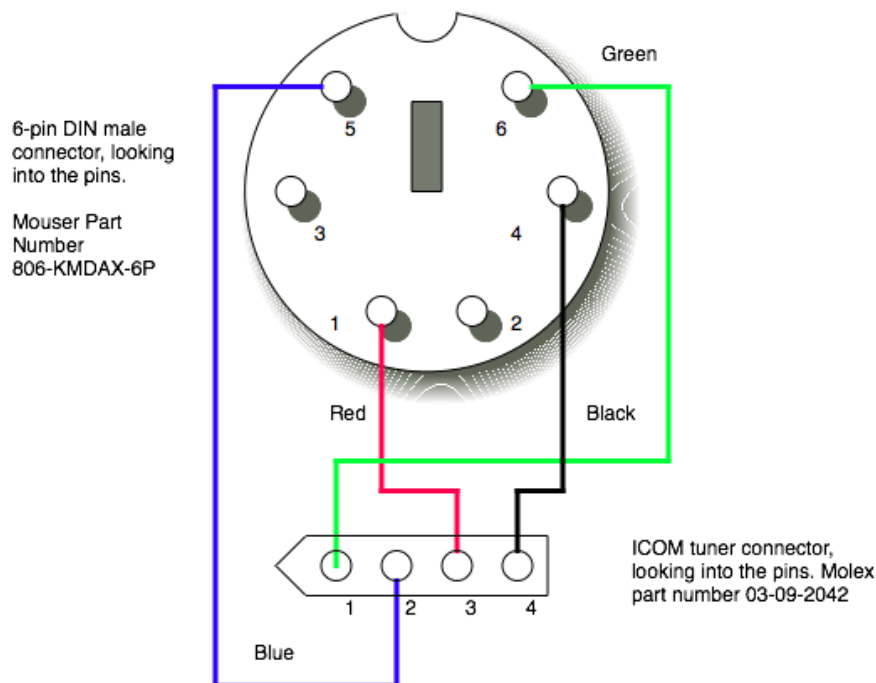
The 4-pin AH-4 interface connector is Molex part number 03-09-2042, available from several online component vendors, such as DigiKey¹ and Mouser². The connector also requires four pins, Molex part number 02-09-2103. The 6-pin Z-100A interface connector is

¹ <http://www.digikey.com/>

¹ <http://www.mouser.com>

² For a very complete treatment of this subject, see any edition of the ARRL Handbook for Radio Communications (previously the Handbook For Radio Amateurs).

Kycon Connector Part Number KMDAX-6P, available from <http://www.mouser.com/> as Mouser part number 806-KMDAX-6P.



MARS/CAP Coverage

The Z-100A provides continuous coverage over its specified range; not just in the ham bands. This makes it useful for MARS or CAP operation, or any other legal HF operation.

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. Also be aware of and follow electrical and safety codes of your municipality.

Operating your Z-100A tuner

When tuning an antenna is not required, there is no need to disconnect anything. Instead, the tuner can be placed in bypass mode by pressing the **Tune** button on the front of the Z-100A momentarily.

The Z-100A automatically powers up at the start of a tuning cycle, and then goes into a low-power sleep mode when tuning is complete. The latching relays hold the tuned configuration indefinitely, even when DC power is completely removed. Tuning memories are stored in FLASH memory.

The Z-100A has 2,000 frequency memories. When tuning on or near a previously tuned frequency, the Z-100A uses “Memory Tune” to recall the previous tuning parameters in a fraction of a second. If no memorized settings are available, the tuner runs a full tuning cycle, storing the parameters for memory recall on subsequent tuning cycles on that frequency. In this manner, the Z-100A “learns” as it operates, adapting to the bands and frequencies during use.

Front Panel

On the front panel there is one pushbutton and two LED indicator lights.



Tune Button: Initiates either a memory tune or a full tune, and also toggles the tuner between “active” and “bypass” modes.

SWR LED: Lights or blinks to indicate SWR condition.

Tuning LED: Lights to give feedback on button activation; lights during tuning; provides tuning status at the end of a tuning cycle.

Rear Panel

The rear panel of the Z-100A features four connectors.

ANT connector: Connect the 50Ω coax antenna feedline to a standard SO-239 connector.



GND connector (wing nut): Connect to antenna system ground.

TX connector: Connect the 50Ω coax jumper cable from this standard SO-239 connector to the ANT jack on the rear of the transceiver.

Radio connector: This 6-pin mini-DIN connector connects to the radio interface cable (supplied), which connects to the AH-4 tuner port on the transceiver. DC power is also supplied via this cable.

Operating Hints

Transceiver Tuner Status Indication

The different models of ICOM transceivers all indicate the status of the external tuner with slight variation. Most will show a graphical or textual icon on the screen to indicate that the tuner is active and has properly tuned. For example, the IC-7000 displays a blinking  icon while tuning, and a solid  icon when tuning is complete. This icon disappears when the tuner is bypassed, and blinks if a tuning cycle failed to find a good match. Other ICOM transceivers behave similarly. Consult your transceiver operating manual's external tuner section for more information.

Mobile Operation

The Z-100A is also perfectly suited to mobile operation. It can be installed under the dashboard along with the transceiver, or mounted remotely. The only requirement is that the tuner remain dry.