



ACOM L-PROT 2000

Lightning Protector
for 1.8-54 MHz,
2 kW antennas
with coaxial cabling

User's Manual

Installation, Operation
and Maintenance

OUTSTANDING HF POWER PRODUCTS

February 2025

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Title of Documentation ACOM L-PROT 2000 Lightning Protector
User's Manual
Installation, Operation and Maintenance

Type of Documentation User's Manual

Purpose of Documentation This manual explains Installation, Operation and Maintenance of the ACOM L-PROT 2000 Lightning Protector.

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	ACOM L-PROT User's Manual	04.02.2025	First edition, R01

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1. GENERAL INFORMATION

Congratulations on purchasing of our exclusive ACOM L-PROT 2000 Lightning Protector.

ACOM is pleased that you have chosen one of our products, and we will endeavor to provide you with the information and support you need to enjoy your purchase for many years.

We urge you to read all of the following materials before you embark on installing and using your new ACOM L-PROT 2000 Lightning Protector.

1.1. Introduction and Description

This manual explains:

- Installation,
- Operation and
- Maintenance

of the ACOM L-PROT 2000 Lightning Protector.

The ACOM L-PROT 2000 is a device for lightning protection of TX/RX equipment in the range of 1.8-54 MHz, 2 kW with coaxial cable not used for (DC) power supply.



L-PROT 2000 provides excellent protection against static electricity accumulation in the antenna and eliminates white noise in the receiver during wind, rain, or snow. It also prevents any DC current flow between the input and output via the two large, surge-resistant discharging/draining chokes, connected from input and output to ground.

Besides, the two chokes DC short-circuit the ports and prevents charges from accumulating in the antenna and filter's decoupling capacitor, which is intended to break the DC continuity between the antenna and the protected equipment.

The air spark gaps limit the back EMF that is generated by chokes at the end of a large, fast-falling current pulse.

ACOM L-PROT 2000 contains a bandpass filter with excellent RF characteristics in the operating frequency range of 1.8-54 MHz with a steep frequency-response slope in the LW/VLF range and less sloped in the VHF range.

The LF/VLF bandpass filter contains two large, surge-resistant toroidal chokes connected from input and output to ground. There is a high-voltage decoupling capacitor between the input and output.

The VHF/UHF filter is implicit because it consists of the LW/VLF filter mounting inductances and capacitances.

Two air spark gaps with massive hemispherical electrodes are installed parallel to the input and output to ground.

The main energy amount of electromagnetic pulses induced in the antenna by a lightning strike (LEMP - Lightning Electro Magnetic Pulse) is concentrated in the frequency spectrum below 100 kHz (LW/VLF band), approaching DC.

Suppression of LW/VLF components attenuates (damps) the main energy, i.e. assures low energy transfer between input and output (low throughput), and almost completely blocks the pulse DC component, while the amplitudes reduction in the VHF/UHF range reduces the steepness of the LEMP pulses, induced in the antenna.

In the rare event of a very close (a forked or even direct) strike, the LEMP voltage is limited by the two massive hemispherical air spark gaps, connected from each connector center contact to ground.

The air spark gaps efficiency is improved by reducing the LEMP voltage steepness, thanks to the VHF/UHF filter section. The massive hemispherical air gaps in ACOM L-PROT 2000 withstand greater surge current and multiple strikes, and last much longer (have greater service life) than commonly used inert-gas GDT (Gas Discharge Tube) arresters.

1.2. To the Reader of this Manual

This document is written for the technically qualified users who will use the ACOM L-PROT 2000.

To ensure your safety in accordance with safety and security standards, read this manual carefully and follow the steps described in it.

Everyone who will use the ACOM L-PROT 2000 must read this manual, and follow the instructions in it, and other accompanying ACOM documentation (see Section **1.5 Additional Documentation**), and consider also the appropriate safety precautions.

Informational notes

Observe the informational notes provided in this manual to ensure reliable and efficient operation of the amplifier. In this manual, you will find the following informational notes:



The information symbol highlights operating procedures or practices that may improve equipment reliability and/or personnel performance, or to emphasize a concept.



*The book symbol represents a **cross reference** to external documentation, e.g., other ACOM manual.*

Symbols and fonts used for marking text

In this manual the following symbols and fonts are used for marking text:

Format	Meaning
Orange bold text	Identifies all internal links in the document between Sections , Figures , Tables , etc. for your convenience.
BOLD TEXT IN CAPITAL LETTERS	Identifies the connectors, switches, and button names and labels.
TEXT IN CAPITAL LETTERS	Identifies the amplifier operating modes, menu names, messages, etc.

1.3. Product Features

- **Easy to use**
The device is bi-directional and works equally in both directions. The coaxial connectors of both ports are marked the same: "IN/OUT" since they are mirror-identical and interchangeable by design.
- **Grounding**
The device is equipped with a grounding stud and wing nut which must be grounded.
- **Installation**
L-PROT 2000 is designed primarily for installation in an electrical cabinet or on the wall, outside the radio shack. The ACOM L-PROT 2000 Lightning Protector is intended for indoor use only.

1.4. Product History and Documentation Validity

The ACOM L-PROT 2000 Lightning Protector serial production started in January 2025.

This manual refers to the ACOM L-PROT 2000 and describes the operating possibilities of all products produced till the publishing date of this manual.

This manual is valid till a new manual is issued.

The covers images used in the manual are illustrative only.

All other images used in this manual can be slightly different compared to your product due to hardware changes and improvements.

Production Version Release Date	Notes
01.2025	Basic design, metal outside box in RAL 9005 color, matt finish;

Table 1-1 | Production versions history

1.5. Additional Documentation

For further important information, please, refer to the following documentation:



- **ACOM L-PROT 2000 Brochure**

The documentation is available for download at www.acom-bg.com.

1.6. Product Identification

Every ACOM product features an ID (identification) label/plate. The ID label is usually on the rear side of the device. On this label, you can find data identifying the device. Which product identification data are important?

- Model designation - The model designation is the name of the device;
- Serial Number - Most products have their own serial number. The serial number is a consecutive number for unique identification of products with the same model designation. It serves to ensure traceability of a product after it has been put in circulation, e.g., to find the date of invoice that is required to determine guarantee and warranty periods. The term serial number is mostly abbreviated to SN or S/N.

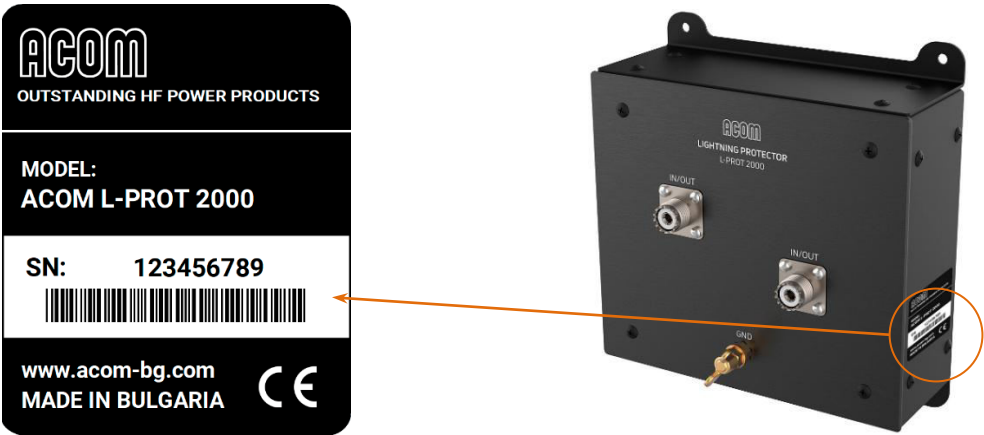


Figure 1-1 | ID (identification) label/plate, example

1.7. Equipment Supplied

The ACOM L-PROT 2000 Lightning Protector is shipped in a cardboard carton.
The ACOM L-PROT 2000 is shipped as package, consisting of:

Nr.	PACKAGE CONTENTS	Pcs.
1	ACOM L-PROT 2000	1
2	ACOM Info Brochure - User's Manuals (hard copy)	1

Table 1-2 | Package contents



The User's Manual is available as PDF-file only.
The latest version of the User's Manual is available at www.acom-bg.com.

1.8. Owner Assistance

If assistance is needed, you should contact your local dealer first. If necessary, your dealer will contact ACOM for additional guidance.

If you still have an issue you need to discuss with one of ACOM's specialists, the contact information is as follows:

ACOM Ltd.

Web-site: www.acom-bg.com -> **Support** page

E-mail: support@acom-bg.com

Bulgaria | Bozhurishte 2227

Sofia-Bozhurishte Industrial Park | 6 Valeri Petrov Str.

GPS coordinates: 42.748616° | 23.209801°



Including the ACOM equipment's model name, serial number, and a detailed problem description in your service assistance request is mandatory. Without this information, we cannot proceed with your request, or the proceeding will take longer.

1.9. Safety Considerations, Explicit Definitions

The ACOM L-PROT 2000 Lightning Protector is intended for indoor use only.

The ACOM L-PROT 2000 Lightning Protector is designed to meet international safety standards and complies with the CE safety and electromagnetic compatibility requirements.

This User's Manual contains information, warnings (signal words **Danger**, **Warning**, **Caution** and **Notice**) and instructions, related to hazards, that should be followed by the user in order to ensure safe operation and to keep the amplifier in a safe working condition at all times.



The safety instructions contained in this User's Manual feature specific signal words (**Danger**, **Warning**, **Caution** and **Notice**) and, where required, a safety alert symbol, in accordance with actual standards ISO 3864 or ANSI Z535.

The EXPLICIT DEFINITIONS described below apply to this User's Manual:

DANGER

*These notes call attention to a procedure or instructions which, if not correctly performed, **will result in serious personal injuries and even death.***

WARNING

*These notes call attention to a procedure or instructions which, if not correctly performed, **could result in serious personal injuries and even death.***

CAUTION

*These notes call attention to a procedure or instructions which, if not correctly performed, **could result in minor or moderate personal injuries.***

NOTICE

*These notes call attention to a procedure or instructions which, if not correctly performed, **could result in property damage or equipment damage not exclusively to the device but also to connected equipment.***

PRECAUTIONS:

DANGER

For safe operation, the L-PROT's grounding terminal labeled **GND** should be connected according to the applicable standards and local regulations for electric safety, fire safety and lightning protection, in all cases the radio station is equipped with outdoor antenna/s!

DANGER

Never run cables into the radio station directly from outside (through a wall or window), whether from antennas, tuners, groundings, telephone, or network lines, etc. The cables should first pass through the foundation of the building where they should be secured in a way that is standard for your region (observe the recommendations stated in Section **1.9.1 General Information about Lightning Protection** at the end of this manual, if no other data is available), in order to avoid conduction of a lightning strike with all resulting consequences - death, injury, fire, equipment damage, destruction, etc. (see Point **8**) in Section 1.9.1 General Information about Lightning Protection).

DANGER

Regardless of the recommendations herein, it is your responsibility to consult a professional electrician for advice on installing your grounding system, and to refer to, together with the electrician, the applicable standards and local regulations for electric safety, fire safety and lightning protection, in all cases the radio station is equipped with outdoor antenna/s, in order to ensure that your installation complies with all applicable requirements. The applicable standards and local regulations shall prevail if there is a difference in the requirements, and if they contain more or stricter requirements than the minimum for installation stated in Section **1.9.1 General Information about Lightning Protection**.

NEVER underestimate the danger of lightning!

DANGER

RF voltage at the antenna feed point and elements may exceed several thousand volts! NEVER TOUCH AN ANTENNA or antenna insulators during transmission or tuning - this may result in an electric shock or burn. NEVER EXPOSE the L-PROT 2000 to rain, snow, or any liquids.

⚠ DANGER

The electronics inside the L-PROT 2000 operate under high voltage, which is fatal! Never allow anyone to insert any object into the box holes or open the box - this will cause electric shock, burning, and death!

1.9.1. General Information about Lightning Protection

Lightning protection grounding is used for lightning protection of people, buildings, and equipment, but does not protect you from voltages or currents with AC mains frequency or emitted/induced RF signals.

Never underestimate the danger of lightning! Lightning may create dangerous current and voltage surges in antennas, antenna feeders, and the equipment connected to them, measured in tens and hundreds of thousands of Amperes and Volts, with steep (fast) rises (a few milliseconds) and a huge quantity of energy dispersed momentarily, comparable to, e.g., an explosion of hundreds of tons of dynamite, yet released in less than a thousandth part of a second.

The measures for safety and reduction of damage to people, animals, buildings, equipment, etc. that may be caused by such a terrifying natural phenomenon, with parameters far beyond the range of human activity, require a clear understanding and strict compliance with clearly defined principles and rules, the most important of which are stated below:

- 1) A short and low-impedance path for discharging the lightning charges into the ground is the key to safeguarding from lightning.

⚠ DANGER

Lightning always seeks the shortest path to ground. Regardless of what obstacles it may meet in its way to it, and regardless of whether such obstacles are good or bad electrical conductors or excellent electrical insulators, lightning ALWAYS overcomes the obstacles - it can burn, destroy or blow-up obstacles, but lightning charges always reach the ground!

Lightning strikes cannot be stopped and it is not possible for protected objects to be "insulated" from them by any means, because lightning strikes act as "current generators" with an electromotive force (EMF) exceeding one billion Volts.

The only possibility is to "capture" lightning and "discharge" it along safe paths to the ground. If such paths are well designed and built, damage will be prevented or minimized.

- 2) Due to the exceptional speed of rising of the lightning pulses (thousands and tens of thousands of Amperes per microsecond), the lower HF impedance we provide for the lightning currents, the lower and less dangerous potential will be generated by such currents in the protected object and, consequently, the danger of secondary discharges to adjacent objects in the protected area will be much lower.

- 3) Due of the exceptional magnitude of lightning currents (tens and hundreds of thousands of Amperes), they instantly create a huge amount of heat in objects they pass through, so the objects can ignite, melt down, rupture, or explode.

Consequently, the lower active resistance we provide for such currents on their path to the ground, the less heat will be released in these objects. The main part of the energy will dissipate in the soil, which is considered a favorable outcome.

E.g., a tree with a diameter of 30 cm or more can be split, exploded, broken, or set on fire by a branch of the main channel of the lightning, while a standard metal lightning rod, taking the main strike of the lightning, survives, although it is much thinner than the tree.

- 4) The enormous electrical pulses induce high currents and create high mechanical forces in both the stricken and nearby objects. To prevent mechanical damage, the masts, antennas, antenna feeders and the entire equipment of the respective grounding system should be mechanically strong, reinforced, and corrosion-proof, in accordance with the expected local effects on the surface and underground.
- 5) The grounding system should be built in such a way that the lightning current does not flow through the protected object, or if it does, it should at least be considerably reduced by redirecting its main part along the paths provided in the design. For that purpose, the grounding system should be carefully planned and designed by thoroughly evaluating the possible paths the lightning currents could go along. Some essential paths for such currents are antennas, antenna feeders and the mains, because they are widely spread and have low impedance to the ground.
- 6) Currents passing through the protected object can be additionally reduced by creating obstacles along the paths through the object, and redirecting the currents along the planned protection paths. This can be done by threading ferrite tubes (toroids) along "unfavorable" paths (i.e. the cables going to and from the protected object). This way, the predominant part of the currents will be tapped to the planned protection path, i.e., through the main grounding plate and all wires and cables connected to it and external to the building. The latter are intentionally left without ferrite tubes - e.g., the system of grounding electrodes, the securing ring of the building, the connections and the cables of the mains coming from outside.

Apart from lightning protection improvement, threading of ferrite tubes (toroids) on the power and signal cables of the equipment in the radio station improves the electromagnetic compatibility (EMC) both between the devices inside the radio station and between them and the outside devices.

- 7) All objects in the area of antennas and nearby devices (within 6 m radius) – tuners, rotators and alike - should be connected by low-impedance connections to a common point called main grounding plate for the antennas and antenna devices, which in turn should be grounded using low-impedance connection to the closest main grounding conductor of an existing or purpose-built (individual) low-impedance grounding system for lightning protection in accordance with all requirements of the local standards and regulations for electric safety, fire safety and lightning protection.

Where antenna counterpoises exist, their connections to the main grounding plate and the connections of the antenna devices should be positioned under the level of the counterpoises or buried underground, if the antennas are designed this way.

To avoid damage or destruction by lightning, the antenna isolators, and the isolators sectioning the antenna and mast bracings into smaller lengths, should be bypassed by pulse overvoltage limiters (lightning surge arrestors). The limiter closest to the ground should be grounded to the main grounding plate, and if the distance is too great, to an individual low-impedance grounding system for lightning protection.

- 8) All cables entering the building should only be laid out in one zone, low in building foundation, and the cable braids and grounding terminals of their pulse overvoltage limiters (surge arrestors) should be grounded immediately after coming out from underground, in a common point called the main grounding plate of the building, to which are connected the mains neutral, (this would not be permitted in the UK) and the structural metal elements of the building – concrete reinforcement, metal pipe installations, metal frames, electrical panels, and other electrically conductive elements of the building (dangers with much plastic tubing in use in domestic water and central heating pipe systems).

The main grounding plate of the building should in turn be equipped with a special individual low-impedance grounding system, driven, or buried directly in the ground, deep enough under the expected frost level of soil in your area, and in compliance with all requirements of the local standards and regulations for electric safety, fire safety and lightning protection.

The expected frost level of soil in your area can be obtained from the local electricity company or weather service. This is very important, since when soil freezes, its resistance dramatically increases. While the frost level of soil is not normally critical in the case of buried counterpoises of RF antennas, an insufficient depth of driving or burying in the ground could increase the resistance of the protective grounding system to exceed the standard requirements several times, i.e., you may be often left without electrical and lightning protection in the winter.

- 9) All objects located in the room of the radio station should be grounded to a common point called the main grounding plate of the radio station, which in turn should be connected through a low-impedance connection to the main grounding plate of the building (see Point **8)** above).

- 10) The grounding terminals of all equipment in the room, the shields of all cables coming in and going out of the room (including telephone, telegraph, network, video, Internet, TV, etc.), as well as the grounding terminals of all pulse overvoltage limiters (surge arrestors), that normally supply any of the wires of these cables, should be connected to the main grounding plate of the radio station.

1.9.2. Grounding for Protection from Electric Shock

This grounding (or neutralizing in some cases) is used for protection from electric shock from currents with AC mains frequency. It will not protect you from a possible lightning or emitted/induced RF signals.

To ensure that your installation complies with the requirements consult a qualified electrician to find out if simultaneous grounding and neutralizing, according to the recommendations of Section **1.9 Safety Considerations, Explicit Definitions**, is allowed by the applicable standards and local regulations for electric shock protection.

1.9.3. Radio Frequency Grounding or Counterpoise

This grounding is used for protection from transmitted/induced RF signals, and possible radio frequency interferences. It will not protect you from a possible lightning strike or currents with AC mains frequency.

These may be e.g., RF counterpoises (radials), which, in particular, could even be isolated from the ground. When they are placed at the required height and have the proper length, they can resonate and be much more effective for RF emission and protection than a direct connection to the ground.

However, this only applies to radio frequencies. They **have no protective functions** against electric shock from currents with AC mains frequency, or lightning.

1.9.4. General Safety Precautions

DANGER

To avoid damage (not covered under warranty) read the Section **2 INSTALLATION** of this User's Manual carefully. Installation of the equipment must comply with local and national electrical codes.

If you have any doubts about the installation, operation, or safety of the device, please consult your dealer.

WARNING

Do not undertake on your own repairs or changes in hardware of the L-PROT 2000 in order not to endanger your or other's health and life and not to damage the device and the equipment connected with it, not covered by warranty. The manufacturer is not liable for another's actions and responsibility shall be assumed by the doer.

2. INSTALLATION

2.1. Unpacking and Initial Inspection



Before you install your L-PROT 2000, thoroughly read this manual.

First, carefully inspect the cardboard carton and its contents for physical damage. ACOM ships the device in protected container, but it cannot assure that mistreatment by shippers will not occur. If damage is evident, notify your dealer immediately. Delay may void the carrier's warranty.



Keep all packing materials for possible future equipment shipment (see Section [4.3.4 Returning to the Service Provider](#)).



Figure 2-1 | L-PROT 2000 in original packaging

2.2. L-PROT 2000 Location Selection and Mounting

NOTICE

ACOM L-PROT 2000 is designed for indoor use only!

L-PROT 2000 is designed primarily for installation in an electrical cabinet or on the wall, outside the radio shack. It should be installed low at the building foundation, close to the building's lightning protection grounding system.

⚠ CAUTION

The unit's weight is about 1.2 kg and can be handled by a single person.

If you choose to mount it in a separate electrical cabinet, two people are recommended to carry out the job.



Figure 2-2 | L-PROT 2000 mounted in an electrical cabinet

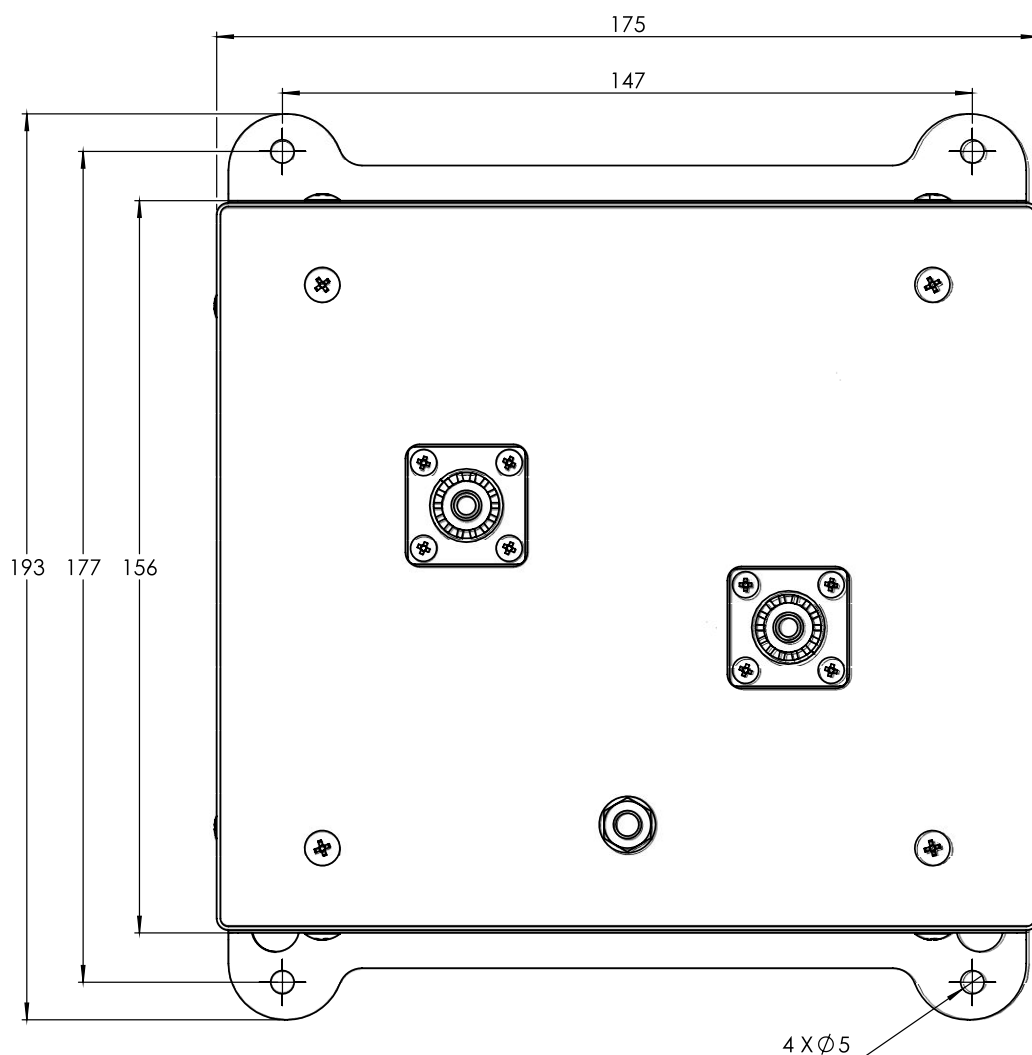


Figure 2-3 | L-PROT 2000 mounting dimensions



The fasteners for the device mounting on the wall or in the electrical cabinet are not part of the delivery.

There are many different wall types or electrical cabinets. Please, look at your preferred store for mounting fasteners and accessories.

ACOM does not offer electrical cabinets as an option for the L-PROT 2000. If you need an electrical cabinet, please look at your preferred electrical component store.

2.3. Installation and Connections

WARNING

Installation of the equipment must comply with local and national electrical codes.

The applicable standards and local regulations shall prevail if there is a difference in the requirements, and if they contain more or stricter requirements than the minimum for installation stated in our documentation.

DANGER

To prevent accidents, device installation and connection to the grounding and antennas should only be carried out in clear, quiet, and sunny weather, when there is no danger of lightning and static discharges.

Life threatening voltages and electrostatic charges may occur in the antenna and the cables you install, both as a result of a direct lightning strike or by induction after a lightning strike on adjacent objects, and may also be statically induced by charged clouds or energized by dust storms!

DANGER

The grounding terminal of the device labeled **GND** and the antenna feeders should be connected as described in Section **1.9 Safety Considerations, Explicit Definitions**.

Do not use grounding systems that are not built to regulations - this may lead to fire, gas explosion, other incidents, or death, including that of other persons. Never use the device, unless it is properly grounded!

WARNING

Before you start connecting the coaxial cable from the radio station to the L-PROT 2000, ensure that its two ends are not connected to anything and take all necessary precautions that no one has access to them! Place warning signs at both ends reading:

WARNING! DO NOT TURN ON - PEOPLE WORKING!

DANGER

Do not proceed with the installation, unless you have connected the L-PROT 2000 grounding terminal marked **GND** to the lightning protection grounding of the building (see Section **1.9 Safety Considerations, Explicit Definitions**).

NOTICE

To avoid any damage (not covered by the warranty), never connect, or disconnect cables while power is applied at either end of the cable.

Hot-plugging is technically incorrect and is a bad practice to connect or disconnect any piece of equipment while it is powered on. Make sure the device is switched off before connecting or disconnecting any cable.



Figure 2-4 | Front panel - Connections

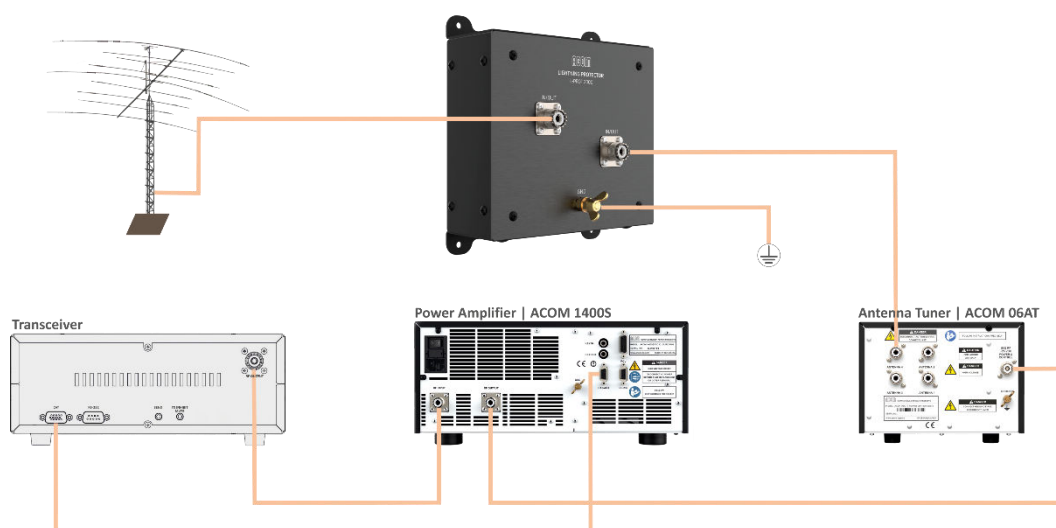


Figure 2-5 | Connection diagram based on ACOM solid-state amplifier and antenna tuner



The installation procedure described below assumes that you have a functional radio station, i.e. you will be adding the ACOM L-PROT 2000 to an existing radio station.



When you have more than one antenna, for example, using four antennas in your radio system, you must add four L-PROT 2000 devices - a single device for each antenna.

NOTICE

When installing, make sure that the holes on the bottom wall of the device are free and open, i.e. nothing clogs neither obstructs them.

2.3.1. GND Connection

Check if the antenna cables and grounding system of your radio station are installed as described in Section **1.9 Safety Considerations, Explicit Definitions**. If they are not installed correctly DO NOT continue, i.e. correct the problems first.

First, POWER OFF your radio station completely and pull out all power plugs from their power supply sockets.

Wait at least 30 minutes and disconnect the input antenna cable from your transceiver, linear amplifier, antenna tuner, etc.

NOTICE

To avoid any damage read your equipment User's Manuals for the correct power off (switch off / switch down) procedures.

Connect the grounding terminal (see **Figure 2-4 | Front panel - Connections**, Pos. 1) of the L-PROT 2000 labeled **GND** to the main grounding plate of the building (see **Point 8**) in Section 1.9.1 General Information about Lightning Protection).

The device's terminal labeled **GND** should be connected through a low-impedance connection with a cross section of no less than 20 sq. mm (preferably flat-shaped and solid - band or plate, rather than with a flexible multistrand cable), to the main grounding plate of the building (see **Point 8**) in Section 1.9.1 General Information about Lightning Protection).

2.3.2. Cable Connection from the Antenna to the L-PROT 2000

After connecting the grounding terminal, you can lay out the disconnected antenna cable from the transceiver (or linear amplifier, tuner, etc.) in the necessary direction to L-PROT 2000 (see [Figure 2-5 | Connection diagram based on ACOM solid-state amplifier and antenna tuner](#)) and secure it.



The antenna coaxial cable must first come (preferably underground) to the ACOM L-PROT 2000 input, and then continue from device output, up to the radio station.

You will often need to modify this cable based on the installation path in your building between the antenna and L-PROT 2000. If you need additional binding points, affix the cables further, e.g., to other surrounding objects and walls.

Finally, connect the antenna feeder to one of the connectors labeled **IN/OUT** (see [Figure 2-4 | Front panel - Connections](#), Pos. 2 or 3).



It does not matter which connector you will use as the device is bi-directional and works equally in both directions. I.e., the coaxial connectors of both ports are marked the same: "IN/OUT" since they are mirror-identical and interchangeable by design.

The antennas should be connected by coaxial cables buried in the ground (when coming in from the field) or securely attached to the wall of the building (when coming down from the roof), all along the route from the antennas to the foundation of the building where, before entering, are discharged from the lightning charges in a safe way - directly into the ground. For this purpose, the braids of the coaxial cables should be securely grounded by a low-impedance connection to the main grounding plate of the building (see [Point 8](#) in Section 1.9.1 General Information about Lightning Protection).

2.3.3. Antenna Cable Connection from the L-PROT 2000 to the Transceiver (or antenna tuner, or amplifier)

Connect the antenna coaxial cable from L-PROT 2000's second **IN/OUT** connector to your transceiver (or antenna tuner, or linear amplifier, etc.) antenna input connector (see [Figure 2-5 | Connection diagram based on ACOM solid-state amplifier and antenna tuner](#)).

You should prepare this cable in advance with the appropriate length based on the installation path in your building between the L-PROT 2000 and your radio station.

Now you can Power On your radio station and use it as usual.

3. MAINTENANCE

DANGER

Do not open the L-PROT 2000 device.

L-PROT 2000 operate under high voltage, which is fatal!

3.1. Periodic Maintenance

Periodically (but at least once per year) check all connections, contact cleanliness and the tightening of all connectors, in particular the coaxial ones.

Check the integrity of the cables, in particular when they are laid on the floor. Check also if the cables are secured well in the area where they come out of the connector body.

3.2. Cleaning

CAUTION

Do not use any solvents for cleaning. They may be dangerous to you and damage device surfaces, paint and plastic components.

Cleaning of the device outer surfaces can be done with a piece of soft cotton cloth.

3.3. Troubleshooting

DANGER

Do not open the L-PROT 2000 device.

L-PROT 2000 operate under high voltage, which is fatal!

In case of trouble, please, inspect all cabling according to Section **2.3 Installation and Connections**.
Clean all connectors with alcohol as needed and check the cables for continuity or parasitic connections.



If the problem persists, you will need to contact your dealer (see Section **1.8 Owner Assistance**).

4. SPECIFICATIONS

4.1. Parameters

- a) Operating Frequency Range
- From 1.8 MHz to 54 MHz;



Please note that the ACOM 500S amplifier can be used with L-PROT 2000 but not on the 4 m band (70 - 70.5 MHz).

- b) IN/OUT Ports
- Two 50 Ω nominal-impedance coaxial RF ports of mirror-identical and interchangeable design, with UHF PTFE connectors (SO-239A), either used for input or output;
- c) Power Handling
- Maximum input RF power, PEP or continuous carrier, at antenna SWR up to 3: 2000 W;
- d) Attenuation and Mismatch of the Useful RF Signal in the Operating Frequency Range
- RF useful-signal attenuation: 0.03 dB maximum;
 - Standing Wave Ratio (SWR) - 1.1 maximum;
 - Return Loss: -26,5 dB RL maximum;
- e) DC Resistance from Each Port to the Grounding Stud
- 12 m Ω maximum;
- f) Rated Discharge Pulse
- 20 kA, 8/20 μ s, 100 shots on each port;
- g) Maximum Discharge Pulse
- 500 A, 10 μ s / 1 ms, 1000 shots on each port;
- h) Maximum DC or AC current, 0 to 60 Hz, each port to ground
- 25 Arms continuous, 100 Arms for 1 s;
- i) Frequency Response Slope in the LW/VLF Range
- 60 dB/dec typ.;
- j) LW/VLF Range Attenuation
- @ 100 kHz: 50 dB min;
 - @ 30 kHz: 80 dB min;

- @ 10 kHz: 100 dB min;
 - Below 3 kHz: 120 dB min;
 - DC: negligible leakage current;
- k) Frequency Response Slope in the VHF/UHF Range
- -40 dB/dec typ.;
- l) VHF/UHF Range Attenuation
- @ 100 MHz: 30 dB min;
 - above 300 MHz: 50 dB min;
- m) Safety and Electromagnetic Compatibility
- Complies with CE safety and electromagnetic compatibility requirements, as well as with the US Federal Communications Commission (FCC) regulations;
- n) Size & Weight (operating, excluding connected cables)
- WxDxH: 175x85x193 mm, 1.23 kg (6.9x3.4x7.6 inches, 2.7 lbs.);
- o) Operating Environments
- Temperature range: -40 to +60 degrees Celsius (-40 °F to 140 °F);
 - Relative air humidity: up to 98% @ +35 degrees Celsius (95 °F);
 - Height: up to 3050 m (10000 ft) above sea level without output deterioration.

4.2. Regulatory Requirements



CE mark (Conformité Européenne)

This symbol explains that "CE" marked ACOM product meets the essential requirements of the Radio Equipment Directive 2014/53/EU, and the restriction of the use of certain hazardous substances in electrical and electronic equipment Directive 2011/65/EU.

4.3. Storage and Shipment

4.3.1. Storage Environment

The L-PROT 2000 may be kept packed in a dry, ventilated and unheated location (with no chemically active substances such as acids or alkalis) within the following environment ranges:

- Temperature range: -40 to +70 degrees Celsius (-40 °F to 158 °F);
- Humidity: up to 75% @ +35 degrees Celsius (95 °F).

4.3.2. Shipping Size and Weight

- WxDxH: Approx. 270x270x100 mm, 1.5 kg (10.6x10.6x4.0 inches, 3.3 lbs.);



Please, contact ACOM (see Section [1.8 Owner Assistance](#)) for shipment details.

4.3.3. Transportation

All types of transportation may be used, including storage in an aircraft baggage compartment at up to 12000 meters (40000 ft) above sea level.

4.3.4. Returning to the Service Provider

This document section contains general information on packing and shipping a device for diagnostics and repair.

NOTICE

Should it be necessary to ship the device, use the original packing as described below.

NOTICE

Before shipping the device, you should contact your local dealer first.

Your dealer can have a specific shipment requirement, e.g., a different shipping address. It is the sole customer's responsibility to ensure the device is properly packaged to avoid any shipping damage.

⚠ DANGER

To prevent accidents, device deinstallation and disconnection to the grounding and antennas should only be carried out in clear, quiet, and sunny weather, when there is no danger of lightning and static discharges.

Life threatening voltages and electrostatic charges may occur in the antenna and the cables you install, both as a result of a direct lightning strike or by induction after a lightning strike on adjacent objects, and may also be statically induced by charged clouds or energized by dust storms!

Prepare the L-PROT 2000 for shipping as described below:

- Switch off your radio station completely and pull out all power plugs from their power supply sockets;
- Wait at least 30 minutes and disconnect the input antenna cable from your transceiver, linear amplifier, antenna tuner, etc.
- Disconnect output antenna cable from L-PROT 2000;
- Disconnect input antenna cable from L-PROT 2000;
- Disconnect the L-PROT 2000 GND grounding;
- Dismounting the L-PROT 2000 from the wall or from electrical cabinet;
- Pack the device in its original cardboard carton (see Section **2.1 Unpacking and Initial Inspection**);
- Seal the device cardboard carton with self-adhesive tape;
- Now, the device is ready for shipment.



Basic shipping insurance is provided by the customer when sending in a device - you can verify the amount covered by the shipping company by looking on their website. If you are shipping the device, full/upgraded coverage is available as a suggested option.



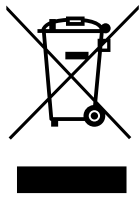
For alternative shipping instructions, please, contact your local dealer.

4.4. Information on Disposing and Recycling of Old Electrical and Electronic Equipment



The information in this section is applicable for countries that have adopted separate waste collection systems.

ACOM products cannot be disposed as household waste.



Waste electricals

This symbol (crossed-out wheeled bin) explains that you should not place the electrical item in the general waste.



Waste electricals

This symbol (three green arrows going in a triangle with electrical plug in the center) means that according to local laws and regulations this product should be sent for recycling.

Old electrical and electronic equipment and batteries should be recycled at a facility capable of handling these items and their waste byproducts.

Contact your local authority for details in locating a recycle facility nearest to you.

Proper recycling and waste disposal will help conserve resources whilst preventing detrimental effects on our health and the environment.



This manual is for electronic distribution mainly.
If you have it on paper and you no longer need it, please, recycle it!

The latest versions of our User's Manuals are available at
www.acom-bg.com

Dealer/Partner's address:

ACOM



📍 ACOM Ltd.

Bulgaria | Bozhurishte 2227
Sofia-Bozhurishte Industrial Park | 6 Valeri Petrov Str.
GPS coordinates: 42.748616° | 23.209801°

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