

EMTRON ES-1
ANTENNA SELECTOR
User Manual

September 2013

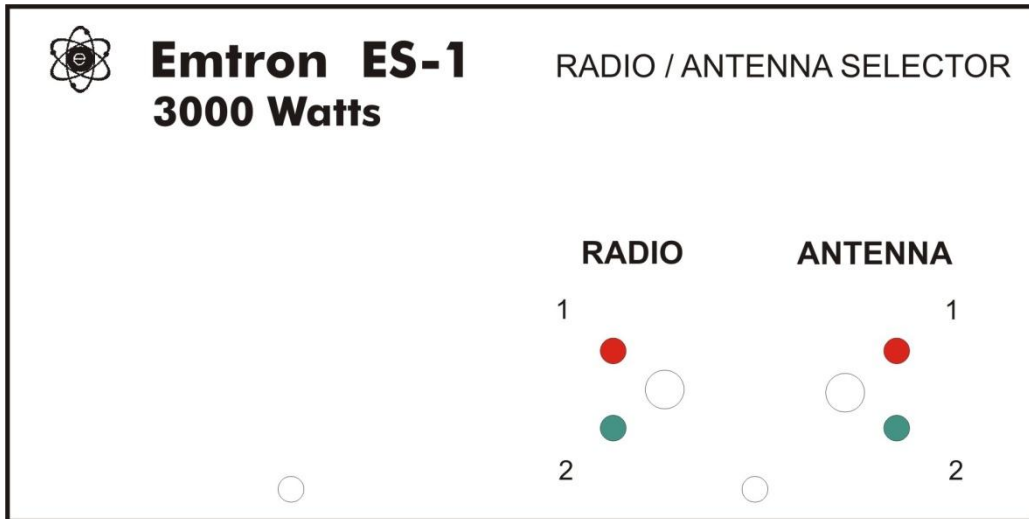


1. General

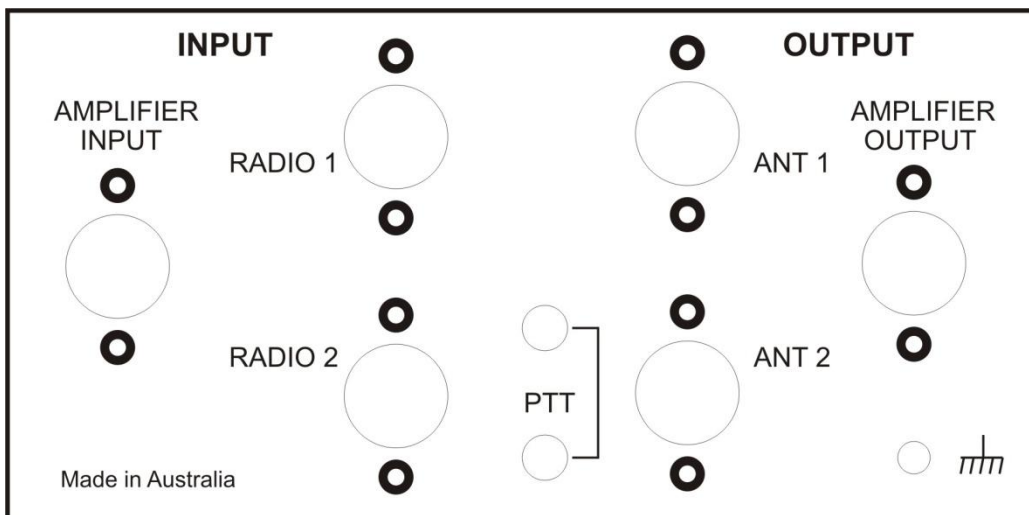
ES-1 is a device that allows using a Linear Power Amplifier with two antennas and two radios and selecting them by front panel switches.

2. Description

ES-1 is contained in a metal box with dimensions 196 x 110 x 80 mm
The front panel has two switches and four LED indicators.



The rear panel has six SO-239 connectors, three for the input side and three for the output side. There are also two RCA sockets for optional PTT connection and an Earth connection with wing nut.



The right hand side panel has a DC power connector and two telephone jacks (RJ11), one near the front and one near the rear panel. These two RJ11 connectors are joined by a short external, removable flat cable (telephone type).

3. Electrical Connections

Use coaxial cable of appropriate rating for the following connections:

- Connect the linear amplifier input to the ES-1 socket marked “AMP IN”.
- Connect the two radios / transceivers / exciters (antenna output) to “Radio 1” and “Radio 2” inputs on the ES-1.

If only one radio is used, connect it to “Radio 2”

- Connect the linear amplifier output to the ES-1 socket marked “AMP OUT”.
- Connect the two antennas (or one antenna and one dummy load) to the ES-1 outputs marked “Antenna 1” and “Antenna 2”.

Other (non-coaxial) connections:

- Unplug the PTT cable from the back of the linear amplifier and plug it into the “PTT” socket of ES-1 (top or bottom socket – internally they are joined together). Connect the other ES-1 “PTT” RCA socket to the PTT socket on the linear amplifier

NOTE: an RCA-male to RCA-male cable is required for this additional connection (not supplied).

This connection is optional, but recommended since the ES-1 “hot switching protection” function will only work with a PTT connection

- An M4 screw with wing nut on the ES-1 rear panel allows it to be earthed. This is an optional but recommended connection.
- Connect the supplied DC power plug into the socket on the side of the ES-1. Connect the black (-) and red (+) wires to a 12Vdc power source. Typically the power supply used for the radio / transceiver can be used to also power the ES-1. The supply voltage limits are in the 11 to 15 V range.

Warning: If the power connection is made in wrong polarity, this will not damage the ES-1, but it will not work. The amplifier input will be connected to “Radio 2” and the amplifier output will be connected to “Antenna 2”.

4. Operation

As soon as the power is connected to the ES-1, two of the front LED indicators will turn on (there is no power ON/OFF switch).

Simply put the IN toggle switch in position 1 or 2 and the top (red) or bottom (green) LED will turn on. At the same time, a relay will be activated, connecting the “AMP IN” SO-239 socket to either “Radio 1” (top) or “Radio 2” (bottom) SO-239 socket, depending on the switch position.

Changing the “OUT” front panel switch between position 1 (up) and position 2 (down) will cause the green or the red indicator to turn on. In this case the SO-239 “AMP OUT” socket is switched by internal relay to “Antenna 1” or “Antenna 2” respectively.

NOTE: If the ES-1 is not powered, the “Radio 2” input is selected (irrespective of the front panel switches, which are not operational and the LED’s are off).

If the ES-1 is not powered, “Antenna 2” is selected.

5. Hot switching protection

Always change the switch positions during receive. Never switch input or output while transmitting.

To prevent inadvertently hot switching, ES-1 has logic that uses the PTT voltage level to inhibit switching. This only works if the PTT connection is used.

To use the PTT connection, it has to be chained: instead of connecting the transceiver PTT directly to the linear amplifier PTT, connect from the transceiver to the ES-1 and from ES-1 to the linear amplifier PTT.

The two PTT sockets on the ES-1 rear panel are internally connected together.

When the PTT input of the ES-1 receives a “high” voltage level (greater than a few volts, typically 12V), ES-1 is fully operational.

During transmit PTT goes low (voltage less than 1 volt). This will inhibit the ES-1 from switching the input or the output.

Warning:

- The front panel switches are directly driving the LED indicators. These LED's are changing according to the switch position even if in transmit mode, with PTT high and ES-1 operation inhibited
- If the switch positions are changed during transmit, the internal relays will not update their positions until changing from transmit to receive. At that moment the relays will switch, assuming the configuration shown by the front panel switches and LED indicators.

6. Remote Control (preliminary information)

Typically the antenna selector will have six coaxial cables wired to the back and many users might prefer to have it installed on top or behind the amplifier, making the front panel switches harder to reach.

An optional remote control unit can be used in this case.

This is a metal box with dimensions 100 x 30 x 20 mm, connected to the main unit by a 4-wire flat telephone cable. The standard cable length is 1.20 m (other lengths on request) and it allows the remote unit to be placed in front of the amplifier or transceiver, or even attached to the amplifier front panel.

To use the remote control:

- Unplug the short cable on the side of the main unit ES-1. The rear end of the short cable needs to be unplugged, the front end can be left in place (connected to the ES-1 front panel). To unplug the cable, squeeze the locking plastic tag on the RJ11 plug and pull it out.
- Plug the longer cable into the rear RJ11 jack. Make sure it clicks, locking in place. Connect the other end of the cable to the remote control unit.

Now the ES-1 front panel is no longer operational, but on the remote control the LED's should be on and the switches are now controlling the main unit. The remote control switches and LED's are identical to the main unit.

7. Specifications

- ❖ Input power: 100 W maximum , 50 Ω load, non-switching
- ❖ Output power: 3000 W maximum, 50 Ω load, non-switching
- ❖ SWR: Better than 1:1.05, 1 MHz to 30 MHz, Input (Radio) and Output (Antenna)
- ❖ Power supply: 12 Vdc, 11 to 15 V range, up to 50 mA current
- ❖ Protection: changing input or output is inhibited when PTT is low (<1 V)

NOTE:

PTT must be connected for this protection to work

The LED's are following the switch position even with PTT low (only the relays are inhibited, not the LED's)

- ❖ Dimensions (overall): 196 x 140 x 85 mm
- ❖ Weight: 0.67 kg (1.5 lb)
- ❖ Remote control available, connected to the main unit by cable