

Connecting the SG-230 smartuner to the Icom IC-706 (all models)

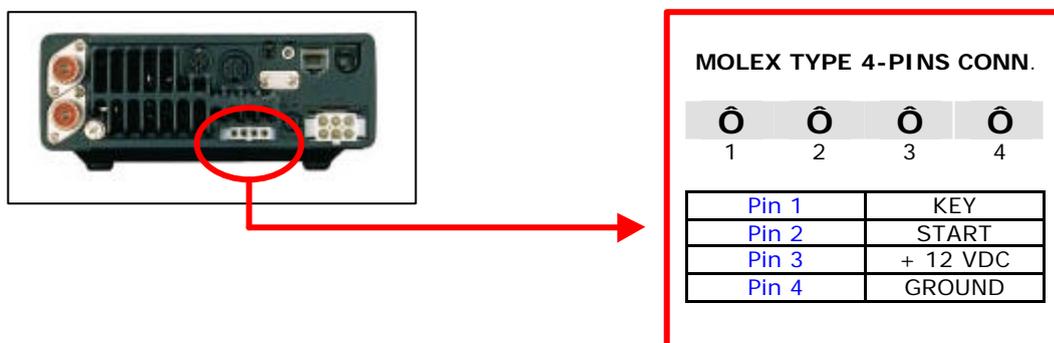
The SCG smartuner family is build to operate stand-alone. You only need to provide 12 VDC power to the coupler and when it sees RF input it starts matching your antenna to the feed line. When you transmit a carrier or talk in SSB the SGC coupler will match your antenna.

But the more recent transceivers have a 'tune' function on the front panel. This tuning function makes life easier. When you push the 'tune' button the transceiver changes into CW mode and generates a tone while transmitting approx. 10 watts.

Normally this function is built in to operate with the transceiver's optional tuners. Nevertheless this document shows how to connect the SG-230 Smartuner to the IC-706 and fully use the 'tune' function.

The Icom IC-706 transceiver.

First let's take a look to the rear of the IC-706 and observe the connector we want to use.



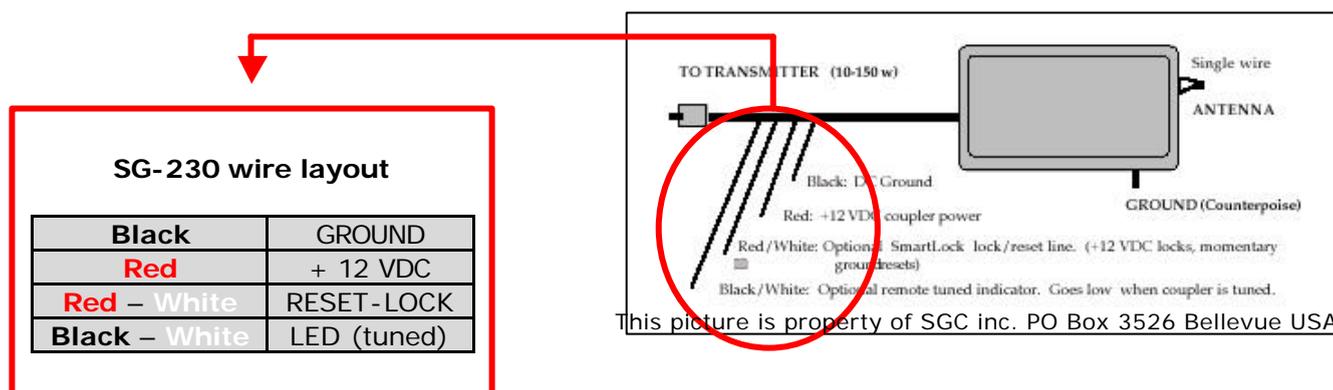
Pin 3 and **pin 4** provide DC output to power the SG-230. By using the DC power supply in this connector the SG-230 automatically powers on and off when switching the IC-706 on or off.

Pin 2 is the START pin witch is connected to the microprocessor. Under normal circumstances the START pin is pulled high when a remote tuner is attached to tell the IC-706 that the tuner is present. When you press 'TUNE' then the radio pulls the pin low telling the tuner to start the matching sequence.

Pin 1 is the KEY pin witch, when the 'TUNE' button is pressed, is pulled low by the tuner to tell the radio to start transmitting. The IC-706 then switch to CW and transmit at approx. 10 watts.

The SG-230 Smartuner.

Second we want to look at the wires whom runs together with the RG-58 9-foot coax feed line.



The **RED** and the **BLACK** wires connect to the 12 VDC power supply.

The **RED – WHITE** wire serves to either RESET or LOCK the SG-230 coupler.

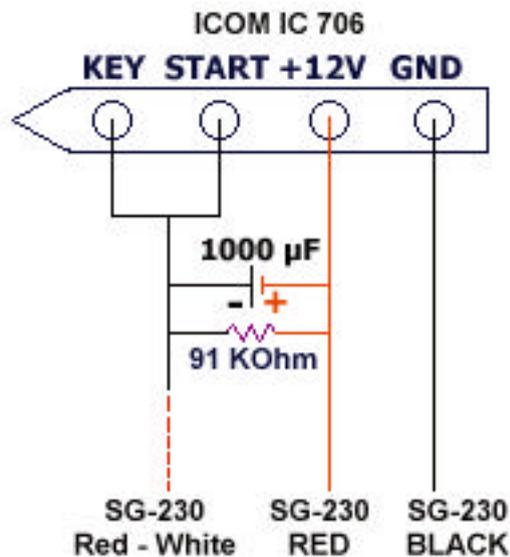
- When connected momentarily to GROUND, the coupler resets and the tuning sequence reruns. This is handy when you dial off frequency and want to force a re-tune to get best match.
- When connected contiguously to + 12 VDC the couplers LOCKS the tuning process and unlocks only if + 12 VDC is no longer present. This is handy when you want to keep the existing match even when you dial off frequency or when the antenna is moving a lot.

The **BLACK – WHITE** wire can be used to connect an optionally LED. Connecting the black-white wire to the positive side of the led and the negative side to ground will result in LED lighting up when a match is present after tuning is finished.

Connecting the SG-230 to the IC-706.

Finally we want to connect both transceiver and the Icom radio to get the 'TUNE' function on the IC-706 working.

Look at the wiring diagram for a successful connection:



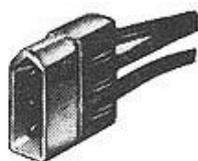
The reason for bridging pin 1 to pin 2 on the IC-706 is that we want to fool the IC-706 thinking that there is a remote tuner (Icom model) present. By wiring pin 1 to pin 2 the START pin (2) is pulled high.

When the 'TUNE' button is pressed, the IC-706's microprocessor momentarily pulls the START pin to ground. Because the red-white wire is connected to this pin (2), the SG-230 will 'reset' and re-nunciates the matching process. Therefore, every time the 'TUNE' button is pressed, the SG-230 will be forced to reset and match the antenna to the feed line at the given frequency.

When pressing the 'TUNE' button, the tune-LED on the IC-706 starts blinking and the 10 watts CW carrier is transmitted. The SG-230 goes through his matching process. The tune-led lights up continuously when the tuning process has ended. Finally the SG-230 stores the new settings in one of his 500 memory channels.

Because the voltage line drops back when the tuning process sometimes is to short to get a good match. Normally the Icom couplers sends back information and the circuit knows the tuning process has to be terminated when the line drops below 2 volts. To fool the IC-706 and prolong the tuning process you have to include an **1000 μ F 25V capacitor** and a **91 K Ohm resistor** both soldered in parallel to make a RC so when the TUNE knob is pressed, the capacitor charges to 12V and the resistor discharges it slowly. Tuning remains for about 8 to 12 seconds and the TUNE LED on the front panel is blinking. If you obtain a mach much faster, you can press the TUNE button again to stop the tuning process.

Note.



If you can't find the exact MOLEX connector model to fit the Icom IC-706's 4-pins connector on the back, you can use the male site of a MOLEX computer-type power supply connector. These connectors are very common and can be found in every computer store. If you cut out one side (see picture) the connector fits fine on the back site connector of the IC-706



Good luck and have fun using your IC-706 and SG-230 !
73 de Philippe Vandekerckhove, [ON4BAW](https://www.on4baw.be)

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