

AMERITRON SDC-104

Automatic Screwdriver Antenna Controller for
Elecraft, Icom, Kenwood and Yaesu Radios

INSTRUCTION MANUAL

PLEASE READ THIS MANUAL BEFORE OPERATING THIS MACHINE!

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Introduction:

The SDC-104 Screwdriver Antenna Controller will automatically adjust the antenna to the transceiver's frequency. The controller reads the frequency from an Elecraft, Icom, Kenwood or Yaesu Transceiver. The controller then moves the antenna to the correct location. The controller connects to any Elecraft, Kenwood or Yaesu that has an RS-232 or Icom CI-V or Yaesu TTL. The antenna must have a sensor installed for the antenna controller to operate properly. If your antenna does not have a sensor, contact the antenna manufacture or Ameritron.

Features:

Automatic antenna tuning

Frequency display

Manual UP/ DOWN buttons

Adjustable current sense trip for Antenna Motor Production

Antenna turns counter

Home

Operation controls

Power: Switches the controller's power on and off.

Up: Moves the antenna up.

DOWN: Moves the antenna down.

SETUP: Allows programming of the antenna

SKIP: Navigates thru the menus

ENTER: Stores the menu setting.

TUNE: Moves the antenna to a programmed setting for the displayed frequency.

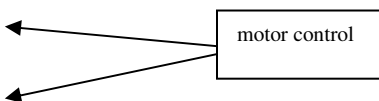
INSTALLATION:

WARNINGING: Do not reverse the polarity of the Red and Black wires. Damage will occur to the controller.

1. The Red Power Line needs to be fused to protect the controller and the antenna. The fuse must be no larger than a 5 amp rating. Some antennas may require a lower current rating. Refer to the antenna's manual for the current rating. Connect the Red wire to a +12 VDC Supply. Use 16 gauge wire when adding additional length.

2. Connect the Black wire to the negative of the power supply or chassis ground.

3. Connect the four prong Molex plug to the antenna. **Note:** Some antennas do not have the correct plug to match the controller's plug. The mate can be order thru Ameritron part number **13-TAR102-2**. Or the plug can be cut off and hard wire to the antenna. See pictorial for wire color and its functions.



Antennas that do not have a 4 pin plug. The plug can be cut off. Use the chart below for wire color and its function.

CONTROL CABLE

RED	MOTOR WIRE
BLACK	MOTOR WIRE
GREEN	SENSOR
WHITE	SENSOR

WARNING: An RF choke must be placed around the control lines at the antenna. The Controller may be damaged if an RF choke is not used.

Motor Operating Voltage

This control unit is designed to operate with a screwdriver antenna that operates on 12 volts. Some antennas operate on only 3 or 4 volts, a Dropping Resistor can be used inline with the motor wires to bring the voltage down. Consult your antenna manual or manufacturer for the operating voltage.

Important: Failure to adjust and operate your screwdriver antenna at the proper voltage will damage the antenna motor.

If a dropping resistor is necessary, a good value to try is 5 Ω /10 Watts. This resistor will need to be placed inline on one of the motor control lines anywhere in between the SDD-104 and the antenna. If you are not sure whether or not this resistor is necessary for your antenna, try it and inspect the torque and speed of the motor. If the motor is too slow, reduce or eliminate the resistance. Use of 12 volts with a 3 or 4-volt antenna will result in failure of the motor.

4. Connect the radio interface cable from the controller to the transceiver. Icom connects to the CI-V port. Elecraft, Kenwood and Yaesu connect to the RS-232 port. A list of interface cables is listed on page 7.

The Transceiver Baud Rate must be set to 9600 bps. For Icom using CI-V port, set CI-V address to 64, Yaesu select CAT or TTL.

WARNING: Do not apply voltages greater than 18 volts to this unit, or permanent damage to the unit and antenna may result.

Note:

The controller will need to be programmed to the antenna before operation. The controller reads the frequency of the transceiver and moves the antenna to the closest programmed setting of the antenna. There can be 8 settings programmed for each band. Some bands may only need one antenna setting programmed to cover the whole band.

Before programming the antenna it may be necessary to move the antenna within the band to determine how many settings need to be programmed for each band. This can be done by pressing the power button to on and pressing the up or down buttons after the current limit has been set properly. Refer to setting the antenna current limit under **TRIP**. Before programming, the antenna will need to be all the way to the bottom and the counter zeroed.

Programming:

1) Turn controller on. The controller will display control and the type of radio it is programmed for. If the display is correct move to step 2. If the controller is not displaying the correct transceiver follow the steps below.

Setting the controller to the Transceiver.

Press setup button until the display reads **STORE**. (5 Sec.)

Press Skip. The display will read **TYPE**.

Press ENTER The Display will read TS 1(This is the setting for all current Kenwood transceivers) If this is the transceiver that you have connected press ENTER. If not press SKIP until the correct type of transceiver is displayed then press Enter.

Flow Chart: Hold **SETUP** for 5 seconds = **STORE** press **SKIP**= **TYPE** press **ENTER**= **TS 1** press **SKIP** **TS 2**> **iCOM** > **FT 1** > **FT 2** > **ELEC**. Press Enter when the correct transceiver is displayed. Kenwood always **TS1** and Yeasu **FT1**. The transceiver should be displaying the transceiver's frequency. The display will show only the four upper digit of the frequency. Ex 14.250 displays 1425.

The controller is ready for programming the antenna to the correct location of the Frequency being displayed.

2) Programming the Antenna.

The antenna controller has a current limit circuit for the antenna. The controller is factory set for 1.2 amps of current. If the antenna exceeds 1.2 amps of current the controller will turn the motor off and display **TRIP**.

The controller's current limit can be changed from 100 mA to 4.9 amps at 100 mA increments. **Refer** to **TRIP** to change the current setting if the controller continues to go into **TRIP** mode.

Press the down Button to move the antenna all the way down. If the down button moves the antenna the wrong way, the motor control wires can be swapped or the polarity can be changed in the controller's menu. Ref to **Polarity** to change the polarity to the antenna's motor

With the antenna all the way down the controller should be displaying 0 for turns, 0 for current and transceiver's frequency. If the counter is not at 0 refer to **CLRP** to clear the counter. It is easier to tune the highest frequency first since the antenna is already at its lowest setting. The transceiver will need to be in **FM**, **RTTY** or **FSK** during this process. Power level about 10 watts of **RF**.

Set the transceiver to the desired frequency for the antenna to be tuned.

The controller should display the same frequency.

1. Move the antenna up to tuned (resonant) position. This should be where the antenna is at its lowest **VSWR**. **Refer** to the Antenna's manual for question about tuning the antenna.

While the antenna is moving the controller will increment between the turns being counted, the amount of current the motor is using and the transceiver's frequency.

2. Store this location under Menu Store 1. To store the antenna's tuned location press **SETUP** for 5 seconds. **STORE** will display. Press **ENTER**. The display will read the band and memory location. Example 28.5 **MHZ** (10 1) Press **ENTER**. The location of the antenna has been stored under memory one for that band. The controller will store up to 8 positions for each band. If another location is need to be stored for the same band. Set the transceiver to the frequency to be tuned. Move the antenna to the tuned position. Remember there is already a location stored in the memory one .This location will be stored in the memory location **2**. Press **SETUP** for 5 seconds **Store** will display. Press

ENTER. The band and memory location will display. Press **SKIP** to move to memory 2. Press **ENTER.** This location has been stored under memory 2. The controller can be programmed for up to 8 positions for each band. Repeat the steps above to program the antenna for the bands the antenna will be used. The memory location can be over written if a change needs to be made or a mistake is made during programming. If the antenna is not programmed for a band it will not move to the nearest location of another band until that band has been selected.

3) After the antenna has been programmed you will have to choose **Manual Operation** or **Auto Operation.**

Manual Operation allows you to switch bands or move around with in the same band with out the controller trying to move the antenna. (This is good for searching for activity on the bands) Once the frequency has been determine press the **TUNE** button. The controller will move the antenna to the closest stored memory location.

Auto Operation The controller will move the antenna to the closest programmed setting when the frequency or band has been changed. **Note:** The antenna will be moving around a lot when searching thru the bands for activity.

Setting the Controller for Auto Operation

Press **SETUP** for 5 seconds or until **STORE** is display. Press **SKIP** display will read **TYPE**, Press **SKIP** again display will read **MODE..** Press **ENTER** **MA**n will display. Press **Skip** to change to **Auto** press **ENTER** to store changes.

POLARITY

The polarity of the antenna motor wires can be changed in the controllers menu. This will prevent from having to changing the wiring to the antenna if you want the antenna to move in the opposite direction when the up or down button is pressed.

To change the direction of the up and down button. Press **SETUP** until **STORE** is displayed. (5 seconds) press **SKIP** 3 times **POL** will display. Press **ENTER** **norm** will display for normal. Press **skip** to change to **REu.** displays for reverse Press **ENTER.** The controller returns back to normal operation and the up and down buttons will be reversed.

TRIP

The controller has a current limit to help prevent the antenna's motor from damage. When the motor stalls the controller will turn the motor off.

The current limit can be changed in the controller's menu under **Trip.** The controller is factory set for 1.2 amps. The current limit can be changed from 100 milliamps to 4.9 amperes with 100 milliamps increments.

To set the trip current form the factory setting of 1.2 amps press **SETUP** until **STORED** is displayed. Press **SKIP** 4 times **TRIP** will be displayed.

Press **ENTER** 12 (equals to 1200 milliamps) will be displayed. Press **SKIP** until the desired setting. Press **ENTER** to store the setting.

INIT

Resets the antenna controller back to factory settings. This will clear all antenna and transceiver settings.

CLRP

Clears the controller's antenna turns counter to zero with out erasing menu setting. If the antenna turns get off for any reason the antenna can be ran all the way down and counter can be cleared by selecting **CLRP** in the menu and pressing **ENTER**.

COAST

DISP

FREQ; Allows only Frequency to display and switches to turns counter when the UP or DOWN button is press.

BOTH; Allows Frequency, Current, and Turn Count to alternate.

HOME (Auto Park)

Home mode moves the antenna down until the counter reaches zero and stops. If the motor trip current is reach when the count is below 10 it will stop the motor and set the counter to zero.

To enter HOME mode Press and hold the UP and DOWN buttons at the same time until the antenna begins to move and display reads HOME.

PRE-MADE CABLES

RJ-DB9KY: Kenwood and Yaesu Transceivers with DB9 (RS-232) (serial)

RJ-8MY2: Yeasu Transceivers with mini 8 pin CAT/ LINEAR.

RJ-DB9E: Elecraft

620-8004 Icom

SDC-104I ships with a mono 3.5mm plug. Ameritron part number 620-8004

SDC-104K ships with Ameritron RJ-DB9KY Cable

SDC-104Y ships with Ameritron RJ-8MY2 Cable

SDC-104E ships with Ameritron RJ-DB9E Cable

Menu flow chart

SETUP (5 seconds) =

STORE> ENTER=band and memory location 1 press skip to go to memory location 2 and so on up to 8. Press ENTER stores the setting under that memory location.

STORE>SKIP=TYPE
>ENTER=TS1>SKIP=TS2>SKIP=ICOM>SKIP=FT1>SKIP=FT2>SKIP=ELEC>ENTER=STORE
TYPE>SKIP=MODE.
>ENTER=MAN>SKIP=AUTO

MODE>SKIP=POLARITY
>ENTER=NORMAL>SKIP=REVERSE

POLARITY>SKIP=TRIP
>ENTER=Motor current shut off adjustable from 0 to 4.9 by pressing SKIP then enter to store the setting.

TRIP>SKIP=INIT

INIT>SKIP=CLRP

OPERATION:

Move the Radio to the desired frequency,

Auto Mode: The controller reads the transceiver's frequency and then moves the antenna to the closest programmed setting for that frequency.

Manual Mode: The controller will read the frequency but will not move the antenna until the Tune button is pressed.

The Up and down buttons can be used to fine tune if needed. The controller will stay at that location until the frequency is changed or the tune button is pressed.

Trouble Shooting:

Controller does not count but antenna moves up and Down

An. 1. Check the plug for loose connection.

2. Need to determine if it is the antenna or controller.

Disconnect the antenna from the controller. Take the end of the cable going to the controller. Press the Up or Down button and tap the two sensor pins together. The counter will increment each time the pins are touched together and then separated. (The up **or** down button must be press during the test) The controller is good if the counter increments. It will be the antenna at fault or a bad wire going to the antenna.

Display will not turn on.

1. Check the power lines to the controller for 12 to 15 Volts DC.

2. One of the momentary buttons could be stuck in the down position.

The controller does not read the Transceiver's Frequency.

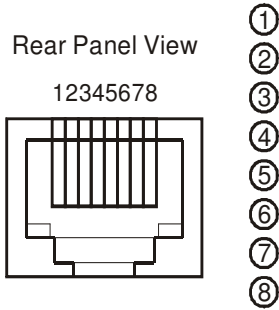
1. Menu is not set for the correct transceiver.

2. Check interface cable connections.

3. Check the menu of the transceiver for correct setting. (Ref. page 4)

The Display reads TRIP when the up or down button is pressed.

1. Trip current set too low. (Ref page 6)
2. Antenna is in a bind.
3. Relay in controller stuck.



SDC-104 PIN OUT CAT -5E EIA/TIA568B

1. GND	OR/WH
2. NC	ORANGE
3 RS-232 TXD	GREEN / WHITE
4 RS-232 RXD	BLUE
5. NC	BLUE/ WHITE
6 TTL TXD	GREEN
7 TTL RXD	BROWN / WHITE
8 NC	GROWN

