

Sierra Radio Systems Station Controller

2 Port VHF Coax Relay Module



sierraradio.net

Introduction



The CX-2 two port RF coax relay module allows you to select two radios to one antenna or two antennas to one radio. The coax relay is rated in a frequency range of 1-500 MHz with minimal insertion loss.

Specifications

- Single pole, double throw
- Power handling 100 watts (or more)
- Connectors: N
- Frequency range 1 to 500 MHz
- 146 MHz insertion loss ~0.5 dB
- 440 MHz insertion loss ~0.7 dB
- Manual actuation button on the side
- LED indicators for device status, link activity and relay state
- 12 VDC power jack 2.1mm barrel connector
- RJ45 DCN network / power jack
- DCN network address DIP switch programmable (1-15)
- Built in mounting flange with screw holes

LED Indicators and Physical Connections



From left to right:

On LED

This led indicator is on when the coax relay is turned on. The LED may also blink when the coax relay module is booting up.

Control button

Pressing the control button will toggle the coax relay.

Link LED

The link LED indicates when the module is registered on the DCN network. The relay module will operate regardless of the state of the link LED.

Status LED

The status LED indicates the current condition of the relay module. This LED is normally on when the relay module is in normal operation.

RJ45 Jack

This is a SRS DCN (Device Control Network) jack. The DCN connection provides data and power from the RPI module or a network hub module.

2.1mm Barrel connector

Optional 12 VDC power input. The relay module is normally powered by the DCN jack. The relay module can also be powered through this jack.

RJ45 DCN Connector

The DCN connector is the main interconnect point between modules, Raspberry Pi board and other optional boards. The pinout of the RJ45 is:

1	RS-485 A
2	RS-485 B
3	n/c
4	+12 Volts In/Out
5	+12 Volts In/Out
6	n/c
7	Ground
8	Ground

With the RJ45 / CAT cable connection you only need to supply power to one of the modules. The CAT cables will carry the power and data between all the other modules.

System Configuration Features

DIP Switches

The dip switches set the devices network address and operating mode.

Address switches

Device address can be anything from 1-15 set through the dip switch. There is an option to set other addresses through the USB serial port.

The default addresses are:

Main dashboard RPI	0
GPIO Module	1
Coax Relay Module	2
RF Watt Meter Module	3
Second Coax Relay Module	4
VHF Coax Relay Module	5 ← Default address for the VHF coax relay.

If you add an additional module you need to select an address not already in use.

You notice most modules have the individual switches labeled “8421”. These number map to the switches. If you are setting the address to 5, for example, you would turn on switches 4 and 1 to give you an address of 5.

Mode switches

The mode switches are normally all switched off. This will run the module in it’s normal mode. Some modules have different behaviors enabled by the switches. These will be document in the future.

An example of this is on the RF power watt meter. One of the mode switches will cause the watt meter to continuously sample the inputs every second and send that data to the DCN. This is not the usual mode because it would clog up a control channel that all the other devices need to use. However you can put the watt meter on it’s own physical channel by hooking up a USB to RS485 dongle creating a new serial port on the Raspberry Pi and thereby moving all the watt meter streaming data to it’s own connection.

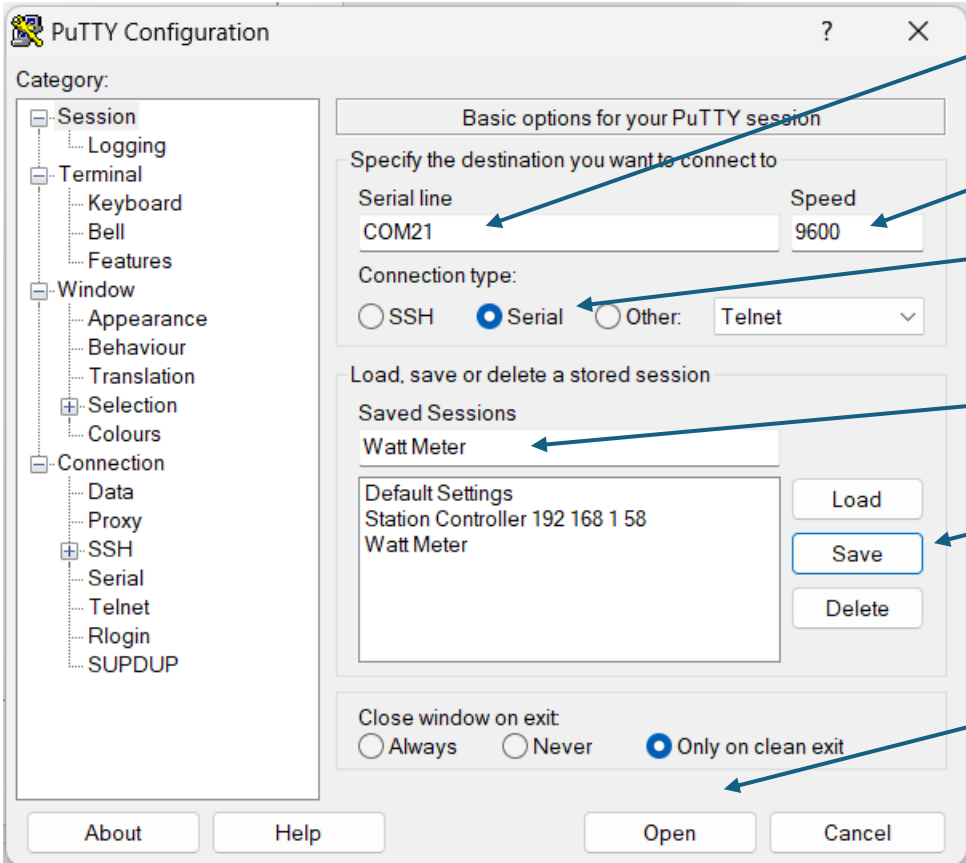
USB Port

The USB port is not normally used in typical operation of the system. It’s primary purpose is to flash new versions of firmware. The port is also a sort of “console” port that allows you to communicate with the board from a dumb terminal program like Putty. You can see the various steps that get executed as the module boots up, send it configuration commands, and other uses. Set your dumb terminal for 9600 baud, 8N1 and check out what the board is doing.

DC Power

The modules all have their own built in 12v power supply. The system needs an input voltage between 10 and 18 volts to operate.

Configuring the PuTTY session



The screenshot shows the PuTTY Configuration dialog box with the 'Basic options for your PuTTY session' category selected. The 'Serial line' field contains 'COM21' and the 'Speed' field contains '9600'. The 'Connection type' is set to 'Serial'. The 'Saved Sessions' list contains 'Watt Meter'. The 'Close window on exit' option is set to 'Only on clean exit'. The 'Open' button is highlighted.

Enter the COM port number.

Enter 9600

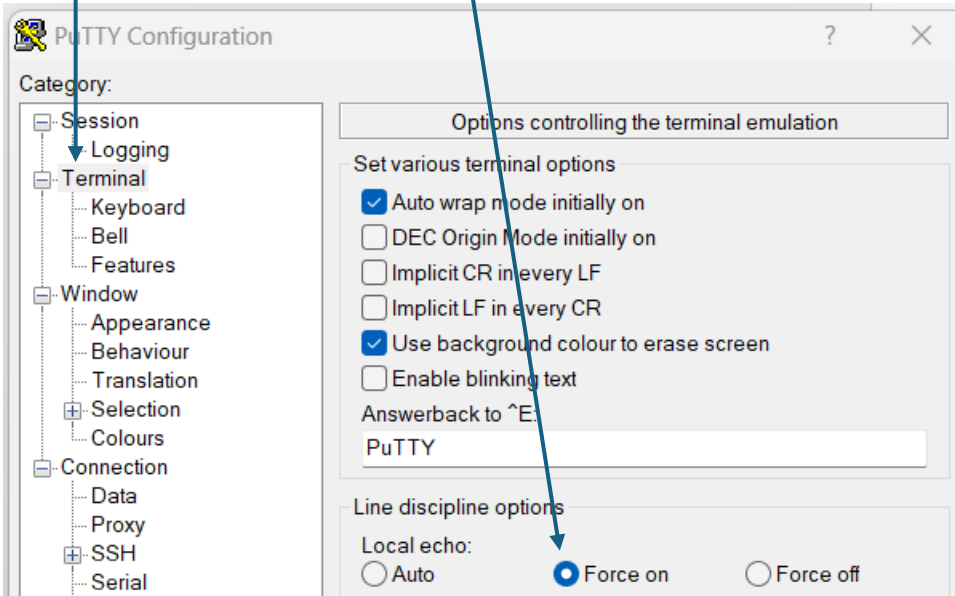
Select Serial

Enter connection name

Click save

Click open

Select the "Terminal" menu. Turn on local echo.



The screenshot shows the PuTTY Configuration dialog box with the 'Options controlling the terminal emulation' category selected. The 'Local echo' option is set to 'Force on'.

Options controlling the terminal emulation

Set various terminal options

- Auto wrap mode initially on
- DEC Origin Mode initially on
- Implicit CR in every LF
- Implicit LF in every CR
- Use background colour to erase screen
- Enable blinking text

Answerback to ^E: PuTTY

Line discipline options

Local echo:

- Auto
- Force on
- Force off

CX-2 Module Commands

When connected to the watt meter using the USB port, there is no need to format commands with the full addressed packet format that you would see on the DCN. This means all commands can be refixed with a //

Relay Control Commands

Command:	RY1	Turn relay on/off
Syntax:	//RY1,1	Turns the relay ON
	//RY1,0	Turns the relay OFF

Command: **RY1,T** Toggle relay

Syntax: //RY1,T

Toggles the state of the relay.

If the relay is off, toggle will turn it on.

If the relay is on, toggle will turn it off.