



SCR Preselector-CAT

Tunable 1.8MHz to 50 MHz Software Controlled Radio preselector.

Featuring tracking operation from dedicated radio software.

User manual. Rev 02

Features:

The SCR Preselector-CAT is suitable to work with SDR or analogue radios. It is inserted between the antenna and your receiver or transceiver providing filtering of R.F.spectrum to reduce broadband energy and conforming signals before they reach the receiver, rejection of the MW AM broadcast band and VHF FM broadcast band, removing strong emissions radiated back to the antenna from quadrature mixers and attenuating signals in the VHF region that could mix with the sampling frequency of the analog to digital data converter in SDR radios.

IMPORTANT: If the preselector is connected in line with a transceiver, take precautions to prevent transmitting through it. An Input/Output power RF relay accessory is available to by-pass the preselector in transmission switch-over.

The SCR Preselector-CAT can be operated in Stand-alone mode, via USB from a personal computer, a software remote control application console is provided for Windows (32 & 64 bits) operate systems, over the Internet or from an external dedicated I2C controller.

Five control modes:

Stand-alone mode: by means of its control knobs.

Remote modes:

- Graphic User Interface (GUI). Remote console on PC.
- CAT serial protocol over Virtual Com Port (VCP), Kenwood TS-2000 protocol.
- Over the Internet or Local Network. (TCP/IP protocol).
- I2C bus from an external dedicated controller.

CAT remote control. Tracking feature

CAT (Computer Aided Transceiver), serial data communication protocol over Virtual Com Port (VCP) enables the SCR preselector-CAT to provide the user with a way to interface with several radios. The SCR Preselector-CAT acts as a passive listener translating valid CAT commands into specific instructions.



Technical features:

- Six selectable bands and preselector By-Pass.
- FiveTuneable Band Pass Filter bank for HF Bands covering 1.8 to 30 MHz plus 50MHz band BPF.
- All filters are LC passive. No active switching or amplifier devices in the signal path, (LNA Off), therefore it does not contribute to IMD (Intermodulation Distortion).
- Very high linearity (IP3). Suitable for Software Define Radios and analogue receivers.
- PTT feature enables connecting in-line with a 100Watts transceiver allowing to by-pass the preselector in transmission. (with external Dual By-Pass relay accessory)
- Two antenna inputs, one antenna output, let insert a converter, filter, etc between antenna and Preselector.
- 0dB, 6dB, 12dB, 18dB input attenuator using MiniCircuits PAT series dedicated attenuation cells.
- Embedded -110dB stop band Broadcast Band Rejection Filter. (AKA BCB filter, Brick Wall filter, MW band killer filter).
- Six Band Pass Filters: ■ Tuning coils wound on large toroid cores T-106 size, rated for 100Watts RF applications, avoiding saturation in front of large signals.
- Band Pass Filters have Notch filters centered on the adjacent amateur bands given an exceptional stop-band attenuation. (see graphic below)
- Digital tuning. Nine bits variable digital capacitor. One pF resolution. (Variable capacitor emulator).
- Two embedded 7th order, 60MHz, Elliptic Low Pas Filter for FM broadcast band rejection and sampling frequency attenuation.
- Switchable low noise amplifier (LNA) 25dB Gain, 38dB IP3, 2.7dB Noise Figure.
- 12V DC/1Amp DC max. output connector for an external 150 Watts RF rating Input/Output by-pass dual power relay. (PTT or Keying line activated).
- Power supply: 12Volts DC/ 1 Amp max. 2.5mm plug power connector.
- Dimension: 220mm x165mm x 52mm (8.661 x 6.496 x 2.047in).
- Weight: 1.5Kg

USB

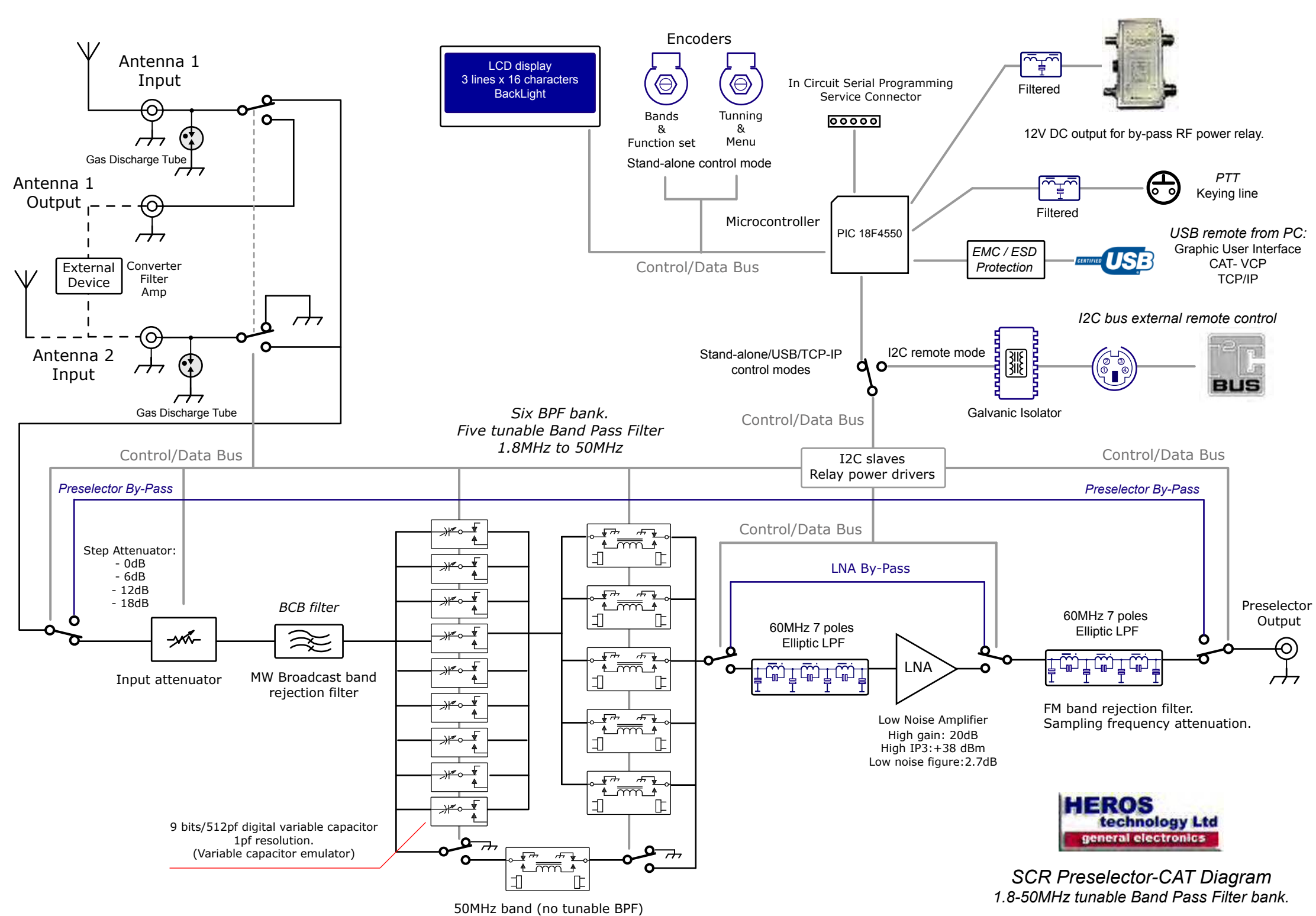
- Full speed USB v2.0 compliant.
- Plug and Play feature.
- USB type B connector.
- ESD protection on USB lines.
- Optional USB Galvanic Isolator available.

I2C bus

- I2C bus external lines Galvanically isolated(ADuM1251).
- 8 bits standard I2C serial bus interface.
- Supports 100Kbits/s and 400kbits/s FAST I2C Bus protocol.
- Mini Din connector for I2C control lines.
- Compatible with most microcontrollers.









1 - Dinamic LCD display.

2 - Function selector.

3 - Tunig/main menu.



1 - I2C bus remote control lines input. 4 ways MiniDin connector.

2 - USB connector. Type B.

3 - Input DC12V/500mA max. Power Jack 2.5mm connector.

4 - Earth post.

5 - RF output 50Ω. BNC connector.

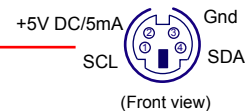
6 - RF antenna 1 output 50Ω. BNC connector.

7 - DC output to external Antenna By-Pass relay, 12V DC/1Amp max.

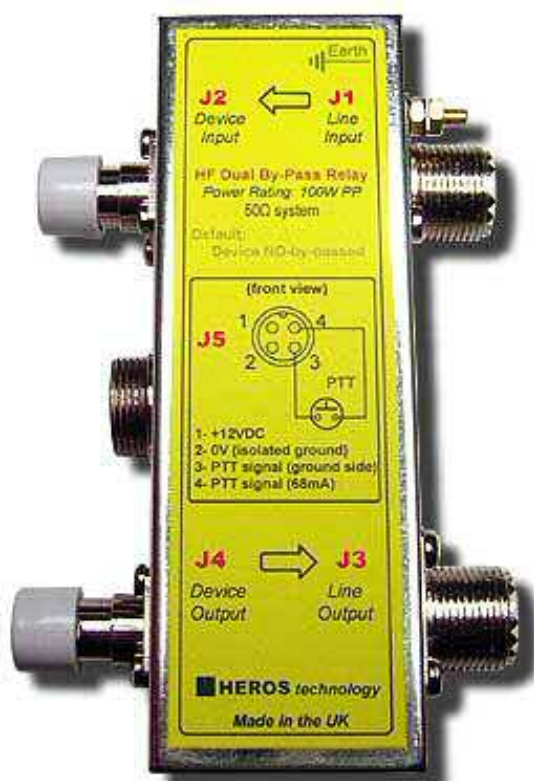
8 - RF antenna 2 input, 50Ω. BNC connector.

9 - PTT/Keying line switch Input. Jack 3.5mm mono.13mA close to ground.

10 - RF antenna 1 input, 50Ω. BNC connector.



Optional Accessories



High Frequency General Purpose Dual By-Pass relay 150 Watts RF power rating DC - 60MHz

A versatile device designed to by-pass the Input and Output RF ports of any ancillary equipment connected in line with your transceiver or transmitter.

On transmission switchover the Input and Output RF ports of any device connected in line are by-passed avoiding being overloaded.

Switching configuration: default By-Passed.

USB Galvanic Digital Isolator for SDR radios

The USB Galvanic Digital Isolator for SDR radios is designed to break the galvanic connection between USB host PC and the attached SDR radio peripheral avoiding that whatever power and ground noise from the PC side do not influence the sensible radio on the other side.

The resultant galvanic isolation improves common-mode voltage, prevents ground loops, a common cause of interference and data distortion issues, improves reception, as the noise floor in the receiver is lowered, and removes spikes and birdies on the PC panoramic screen. In addition provides isolation of 1000V AC between the host PC and the radio peripheral that guard against surges that may come from the antenna connected to the receiver.

The USB Galvanic Digital Isolator for SDR radios is based on ADuM 4160 Full/Low Speed 5 kV USB Digital Isolator and ADuM 5000 Isolated DC-to-DC Converter both from Analog Devices combining high speed CMOS and chip-scale air transformer iCoupler technology.

The USB Galvanic Digital Isolator complies with specifications USB 1.1, Low speed (1.5Mbit/s) and USB 2.0 Full Speed (12Mbit/s). The speed mode is set manually via two jumpers inside (default full speed). Most of the time it is not necessary change between modes but if automatic speed detection is desired, an external hub can be connected to the peripheral side configured for full speed.

The USB Galvanic Digital Isolator is self powered from the host PC through the USB cable. An embedded DC/DC converter provides a galvanic isolated voltage of 5VDC/100mA to the peripheral side. It includes additionally ESD, EMC protection of the data lines and power transient short-circuit guard.

It is highly advisable not to power any part of the connected radio from the USB bus, instead an external dedicated power supply must be used.

The USB Galvanic Digital Isolator behaves like an USB cable, no USB drivers are needed. It works on all operating systems, Mac, Windows, Linux, etc.

Features:

Isolation 1.000 Volts AC

Protection: EMC, ESD, Overvoltage Surge, Short-circuits.

Power supply:

- PC side: From USB cable, 5VDC. Attached signalling LED.

- Drawn power from peripheral radio max: Through USB cable, 5V DC/100mA.

USB modes: Full speed (12 MBit/S) Low speed (1.5 MBit/S). Switchable.

Standard socket connectors: PC side: USB type B, peripheral side: USB type A.

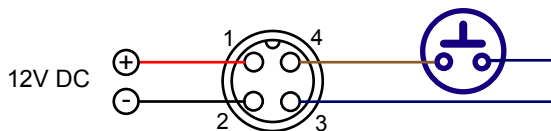
Dimensions 67 mm x 66 mm x 28 mm. (2.638x2.598x 1.102inch)

USB2 pair of cables included



HF Dual By-Pass relay model: Default By-Passed

Control line connectors wiring
(Front view)



SCR Preselector-CAT

RF Output

Antenna Input

Control cable

J2

J5

J4



J1

J3

High Frequency Dual By-Pass Relay

By-passing example
SCR Preselector-CAT connection diagram.

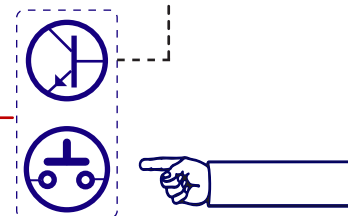
- * Reception (relay is activated by Preselector)
 - Ports J1-J2 connected
 - Ports J4-J3 connected
- * Transmission (relay NO activated)
 - Port J3 connected to Port J1
 - Ports J2 and J4 are connected to ground.

**Generic Transceiver
(150W max.)**

Antenna Input



Switching line

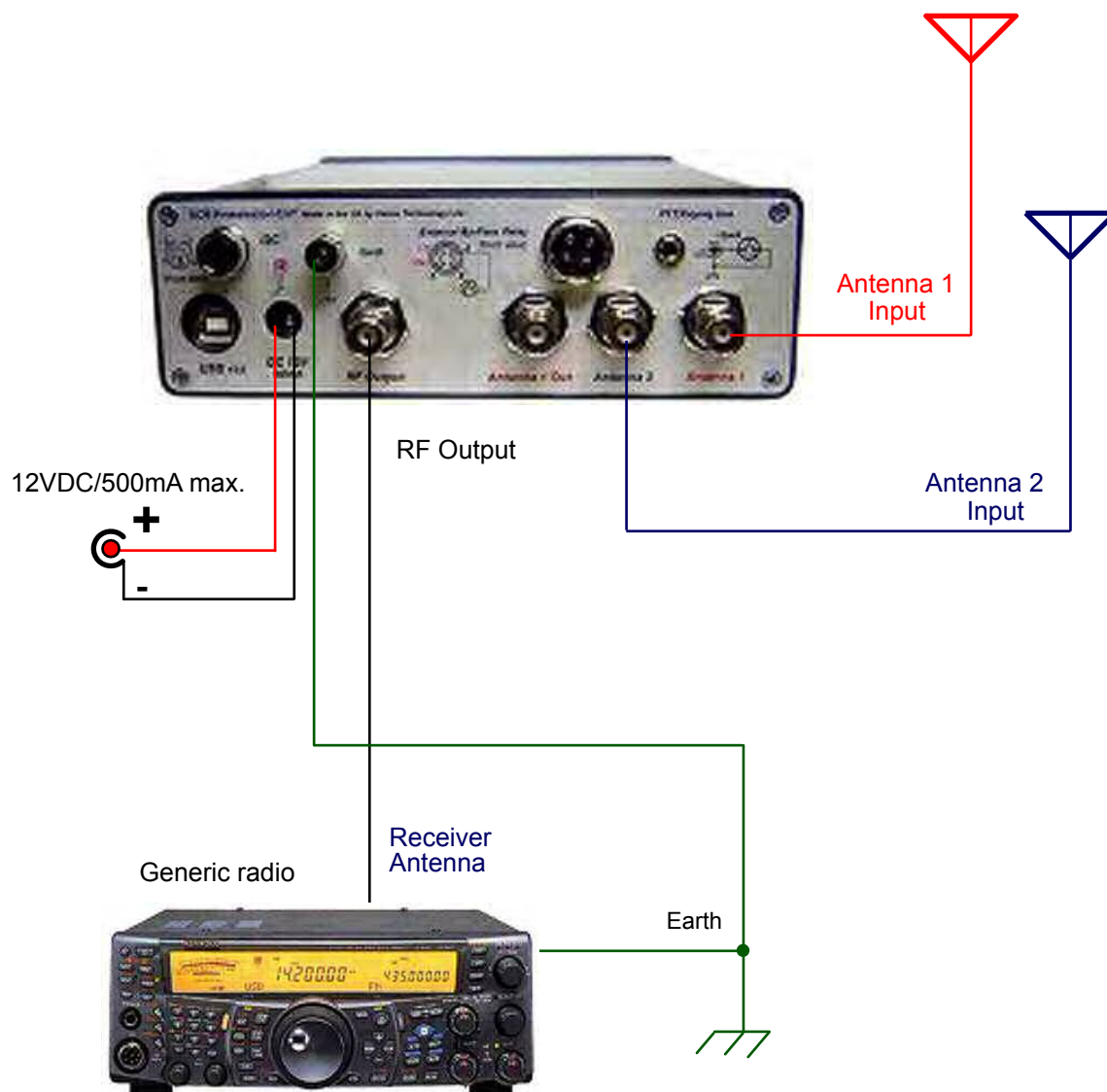


Logic or manual switching

WARNING TO AVOID DAMAGE THE UNIT!

In order to give enough time to the relays to switch before the RF power signal outputs the transceiver when the PTT is pressed, assure that your transceiver provides a delayed "SEND" control line signal. Normally that control line is present on Linear Amplifier connector. Also several transceivers feature a programmable delay, see the owners manual of your particular radio.

Alternatively a Transmission/Reception Sequencer can be used.



SCR Preselector-CAT Interconnection. In line with a receiver. Stand-alone mode.

Remote control console on PC



USB cable



Optional USB Galvanic isolator



Earth

150 Watts RF rating Input/Output
by-pass dual power relay.
(model: Default By-Pass)

Antenna 1
Input

Antenna

12VDC/1 Amp



RF Output

Relay control

PTT/Keying line
13mA close to ground

Generic Transceiver



Earth

Transceiver
Antenna

SCR Preselector-CAT interconnection. In line with a 100W Transceiver.

Remote control console on PC



Optional USB Galvanic isolator

USB cable



RF Output

Antenna 1
Input

Antenna 2
Input

12VDC/1 Amp.

Receiver
Antenna

Generic radio

Earth



SCR Preselector-CAT PC interconnection. In line with a receiver.

Remote control console on PC



USB cable



Optional USB Galvanic isolator



Antenna 1
Input



External device: Converter



12VDC/1 Amp.



Antenna 1
Output

Antenna 2
Input

Converter Input

Converter Output

RF Output

Generic radio



Receiver
Antenna

Earth



**Antenna menu:*

Antenna 1 selected, converter by-passed.

Antenna 2 selected, converter in line.

SCR Preselector-CAT Interconnection. External device

PowerSDR on PC

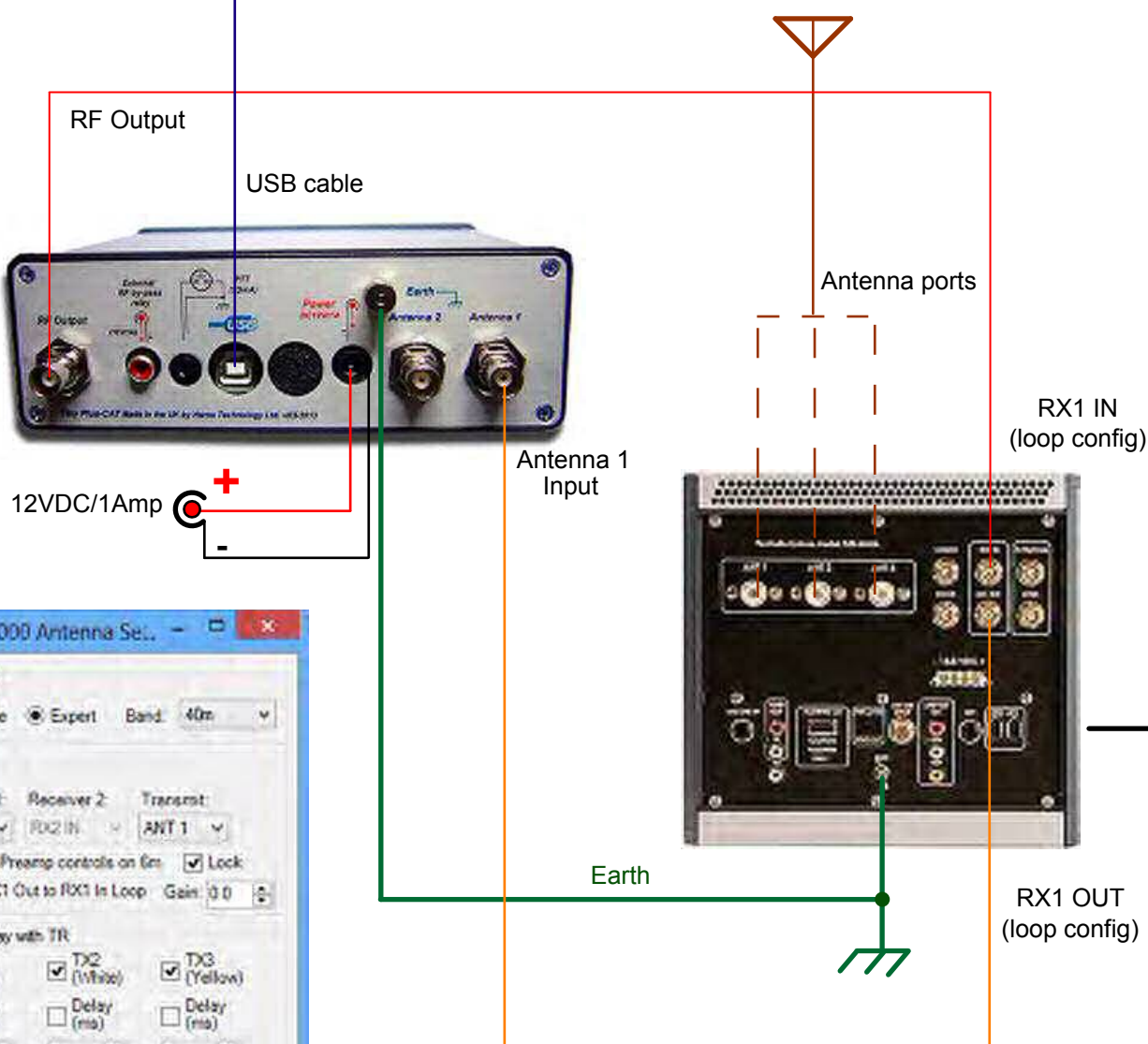


CAT remote control (tracking)
Virtual COM port over USB

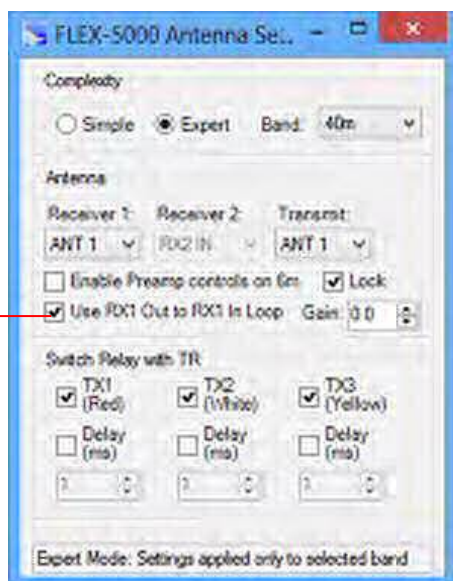


FireWire cable

NOTE:
No CAT utilities or COM port splitter software is needed.

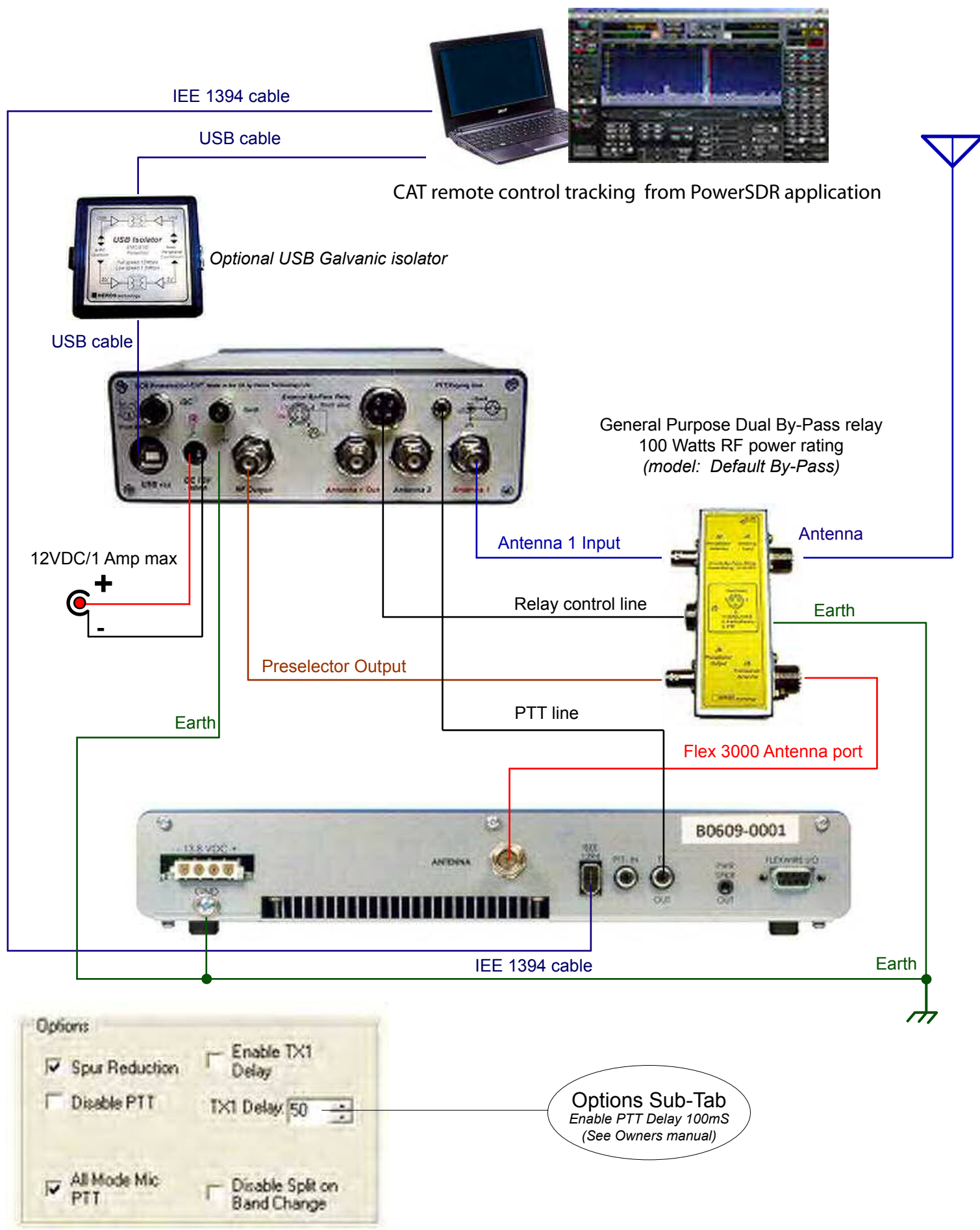


Loop

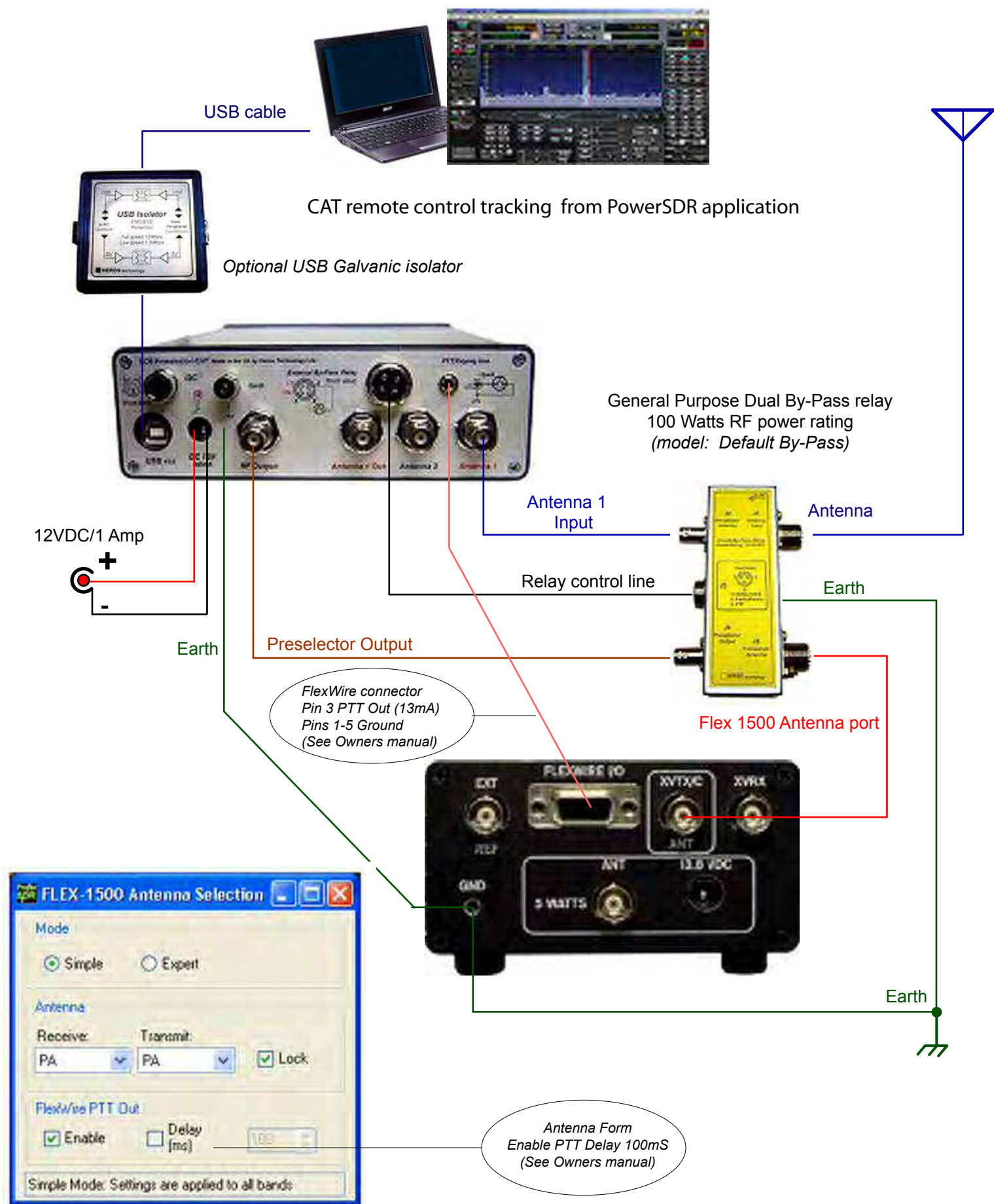


(see Primary antenna ports configuration
on FLEX-5000_Owners_Manual)

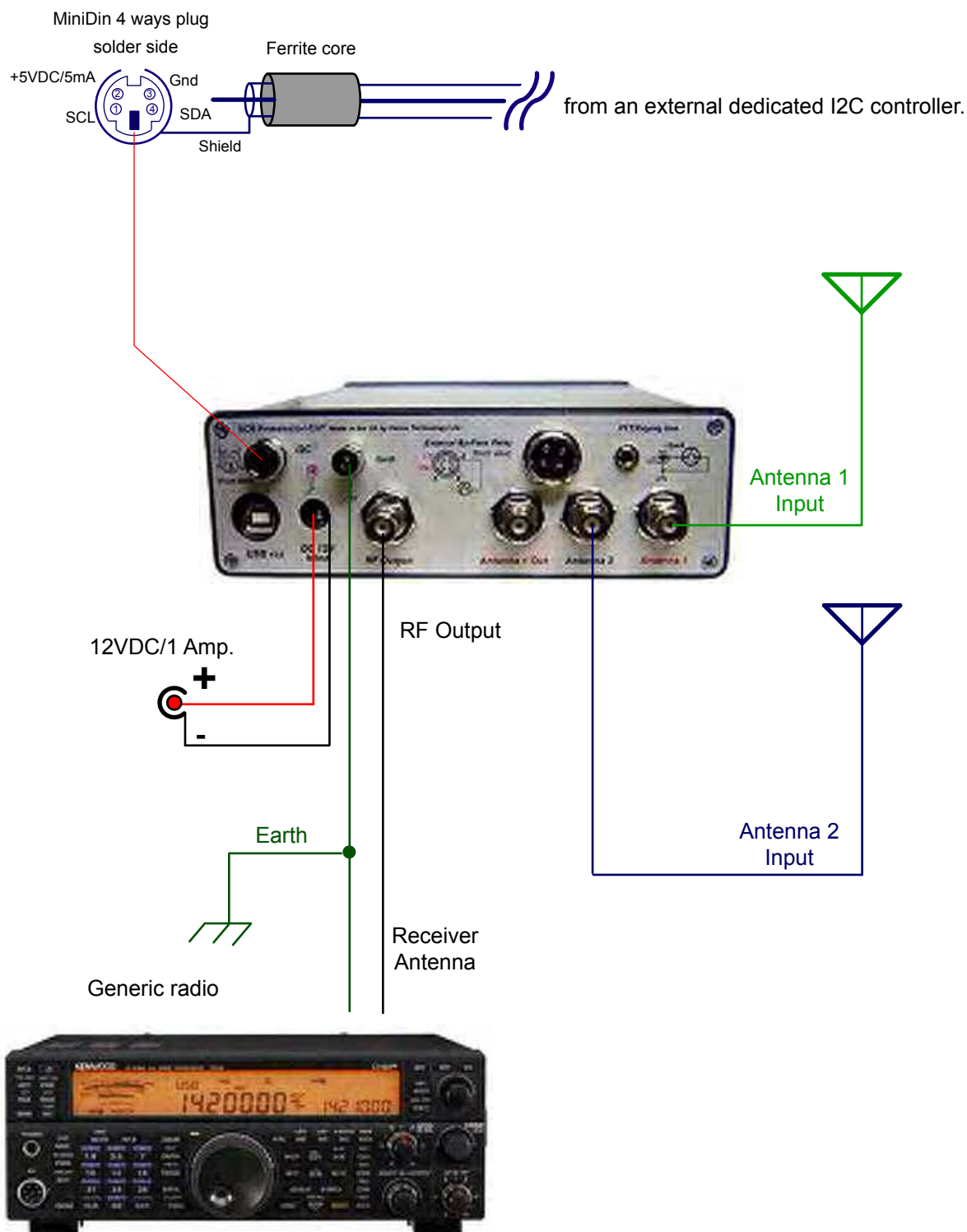
SCR Preselector-CAT interconnection. FlexRadio.



SCR Preselector-CAT in line with Flex 3000 transceiver. Connection diagram



SCR Preselector-CAT in line with Flex 1500 transceiver. Connection diagram



SCR Preselector-CAT interconnection. I2C bus mode.

Important:

If the preselector is connected in line with a transceiver, take precautions to prevent transmitting through it in transmission switch-over. In this regard a suitable RF by-pass relay accessory is available.

Copy the contents of the CD-ROM provided into your computer; do not execute software applications from CD-ROM.

Keep safe a back-up of the original calibration tables included on the CD-ROM.

Assure to use a reliable external power supply providing 12 Volts DC-1 Amp. preferable based transformed instead switching technology in order to avoid noise.

Avoid using a rating power supply of 20-40Amp generally used to feed transceivers. They are designed to manage strong loads no low current ancillary equipment.

Power first the power supply feeding the SCR Preselector-CAT, next switch on the power toggle switch located on rear panel, no on the contrary.

Wait for a Power ON delay of around five seconds.

After switching off wait for several seconds before switch on again.

Avoid switch off suddenly the Preselector if it is connected to a computer via USB port. A data transaction may be occurring, if so the micro-controller on board, computer software or USB port could be damage. Close or stop first the application running on the computer. For the same reason avoid unplug suddenly the USB cable.

Caveats:

If you are working with Windows 7 and specially Windows 7 /64 bits O.S. it is highly recommended to upgrade to Windows 8.1

Computer COM ports are a limited resource and must be managed properly or your whole radio system could be severely compromised.

Any unnecessary activity should be avoided in favour of avoid saturate the COM ports.

Experimental/beta Radio Control Programs should be avoided.

Heros technology Limited disclaims all liability arising from the use of third party CAT software.

Installing Windows 8.1 USB Driver.

By default Windows 8.1 enforces driver signatures (covert taxation); in order to disable it:

Log on Windows as Administrator.

From the Metro or Desktop:

Bring up mouse over to the right side of the screen.

Go to Settings

Change PC Settings

General

Advanced Start-up > Restart Now

Trouble shoot > Advanced options

Start-up Settings

Restart the computer

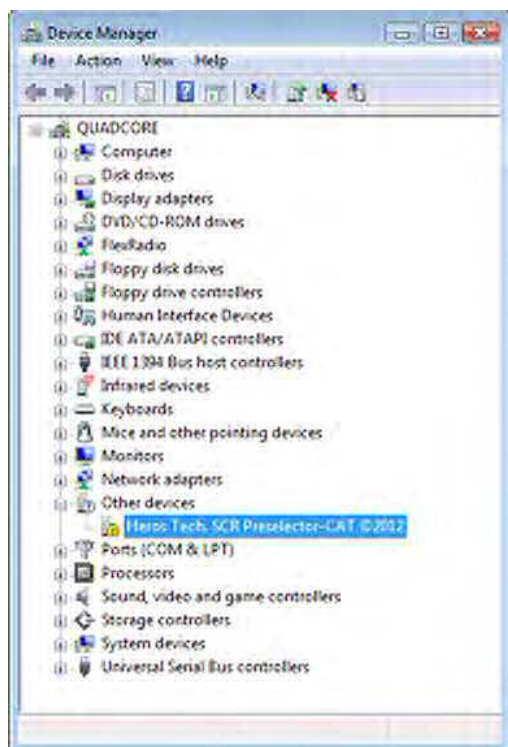
New Blue Window: Start-up Settings/ 'Disable driver signature enforcement'/ press F7

Restart the computer.

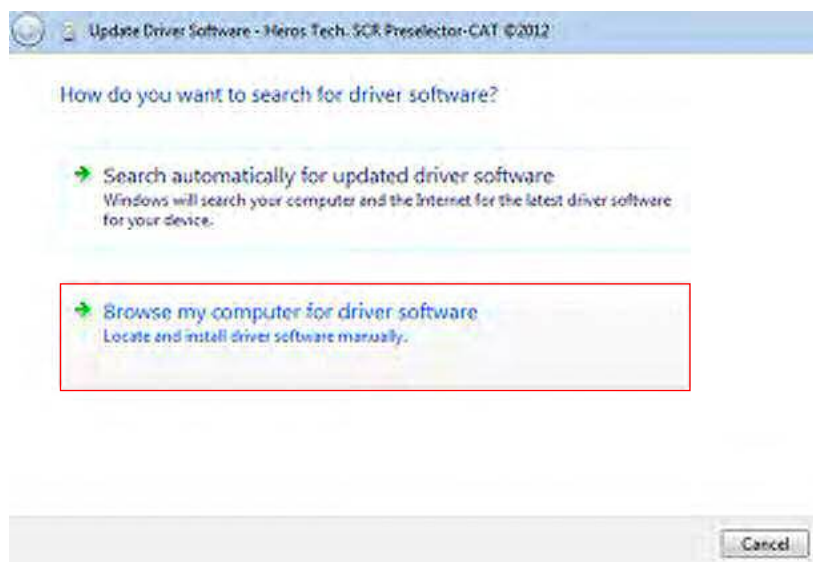
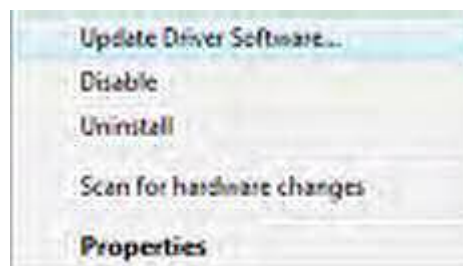
Install the relevant driver, allowing to install on the "non-signed driver" message window.

When plugging for the first time to the USB port the system will ask for install the driver software.

- Ignore the "Found New Hardware" window and go to "Device Manager"
path: Control Panel/System/Device Manager`.



- Right mouse button on "Heros Tech.SCR Preselector-CAT 2012" and click on "Update Driver Software"



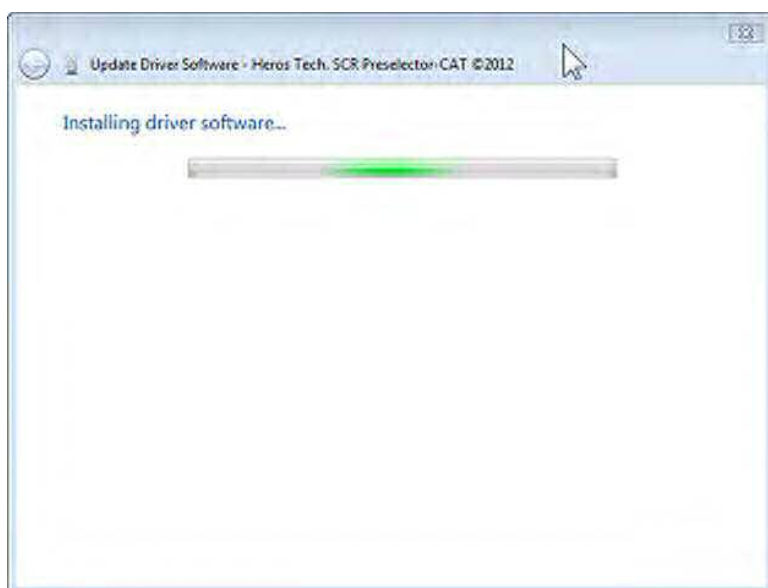
- Click on "Browse my computer for driver software"

Locate " SCR Preselector CAT.inf " file in the SCR Preselector-CAT Driver folder and click "Next" button.



Click on "Install this driver software anyway."

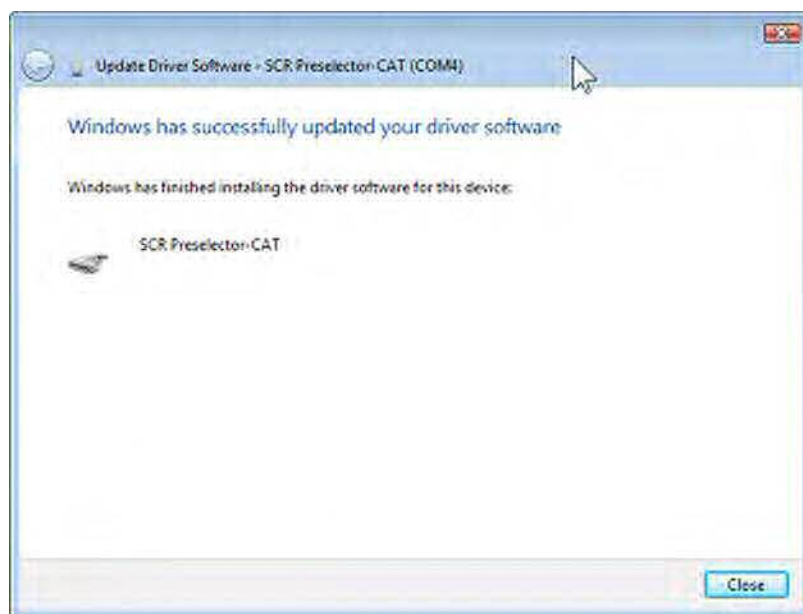




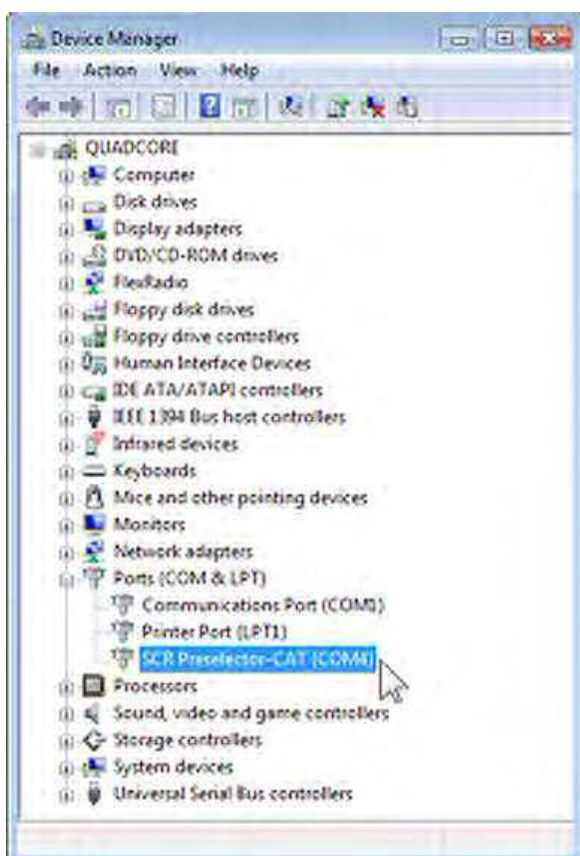
Installing driver software



Driver successfully installed



A Virtual Com Port has been created over the USB port



Getting started

Select among the above connection diagrams to set-up the SCR Preselector-CAT according with your radio system.

IMPORTANT: If the preselector is connected in line with a transceiver, take precautions to prevent transmitting through it. An Input/Output power RF relay accessory is available to by-pass the preselector in transmission switch-over.

Copy the contents of the provided CD-ROM into your computer, do not execute software applications from CD-ROM.

Keep safe a back-up of the original calibration tables folder on your computer.

Power Up.

Assure to use a reliable external power supply providing 12 Volts/ 1 Amp DC.

Avoid using a power supply of 20-40Amp generally utilised to feed transceivers. They are designed to manage strong loads no low current ancillary equipment.

Power first the power supply feeding the SCR Preselector-CAT, next switch on the power toggle switch located on rear panel, no on the contrary.

Wait for Power ON delay of 5 seconds.

After switching off wait for several seconds before switch on again.

Avoid switch off suddenly the Preselector if it is connected to a computer via USB port. A data transaction may be occurring, if so the microcontroller on board, computer software or USB port could be damage. Close or stop first the application running on the computer.

For the same reason avoid unplug suddenly the USB cable.

Switching on the preselector, a welcome message is displayed. (Image 1)

Rotating the Function selector knob(2) the LCD display changes to main menu.(Image 2)

By default Stand-alone mode if the USB cable from PC is detached. To change among modes rotate and press Function selector knob(2)

They are five preselector control modes to choose:

- Stand-alone mode.

Through USB from PC:

- from Graphic User Interface application (GUI).
- CAT from a dedicated radio software.
- TCP/IP from the Internet or Local Network.
- I2C mode from an external dedicated controller.

Stand-alone mode of operation

To navigate through the main menu rotate the Function selection knob(2) and press on the desired option. Available options are: (Image 2-3)

Stand-alone mode.

USB-CAT-TCP/IP mode.

I2C mode.

By-Pass.

Band A to F.

Each band has its own menu, rotate Function selector knob(2) to position the cursor on any function press and release the knob to change options. (Image 4)

Band F, 50MHz band, is a non tunable BPF so no tune value is shown. (Image 5)

They are five memories available for each band. Each memory keeps all parameters shown on display. (Image 6)

To change to main menu press Tunig-main menu knob(3).

Attaching the USB cable from PC changes display accordingly. Rotating the Function selection knob(2) the LCD display changes to main menu.(7)



Image 1



Image 2

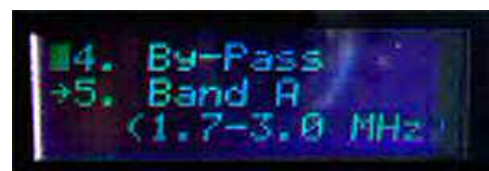


Image 3



Image 4

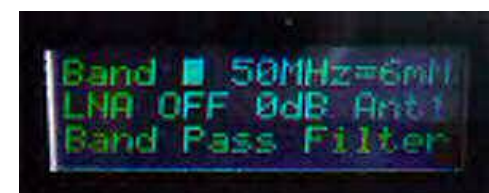


Image 5



Image 6



Image 7

Graphic User Interface (GUI) on PC. Remote control console.

The SCR Preselector-CAT is commanded by the user by means of the GUI console on PC as it would in stand-alone mode. The GUI context menu provides additional options and utilities.

The application console runs under Windows (32 & 64 bits) operate systems.

Open the SCR Preselector-CAT application; a pop-up window will emerge indicating the USB connection status. By default the preselector application starts in by-pass state on power-on. In this state all controls are disabled except antenna selection and context menu.

Available controls, options and utilities are itemised below.



1- **Band selection.**

Click over band push-button to change band or live By-pass state.

2- **Input attenuator.**

0dB, 6dB, 12dB, 18dB of attenuation available.

3- **Low Noise Amplifier.** LNA ON/OFF.

4- **By-Pass.**

By-passes the preselector. Default on power-on. In this state all controls are disabled except antenna selection and contextual menu.

5- **Antenna selection.** Two antenna input available. Active in by-pass state.

6- **Tuning step.** x1, x2, x5, x10. Position x1 performs scan clicking on the dial.

7- **Tuning knob.**

Performs tuning rolling the mouse wheel. Also by pressing left or right arrows on the keyboard. Adjust to maximum signal or background noise.

8- **Tune Reference Dial.** Displays the actual tuned frequency and the corresponding capacitor value. Notice the attenuation of the pass band filters increases with less capacity due to the response of series tuned circuits.

9- **Mnemonic text box.** A brief caption can be written in the text boxes. Five memories for each band can be stored, twenty-five in total. On band change memories and captions are updated.

10- **Memory management.**

11- **Frequency scale.** Frequency references on the scale are updated in accordance with the calibration tables.

12- **Context menu.**

Right mouse button click on dial or function key F2 opens the context menu.

13- **PTT pushed on.**

Context menu

Right mouse button click on dial window or function key F2 opens the Context menu.

A set of program options are available to the user as follows:

Set Frequency...	F3
I2C Slaves' Addresses...	F4
Write tables...	F5
Logfile...	F6
Firmware update...	F7
Remote Client...	F8
Remote Server...	F9
Send CAT command...	F10

Set Frequency. Function key F3



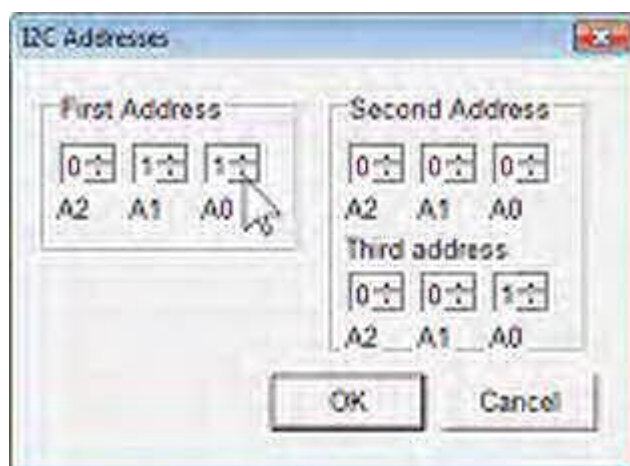
Enter any valid frequency expressed in MHz.

I2C slave's address. Function key F4

Internal I2C slaves address can be changed.

Useful when the preselector is working in I2C remote control mode.

Notice that the Third address, bit A0, is always the complementary value of Second address one. Address is obtained automatically by software.



Calibration table

Write calibration tables. Function key F5

IMPORTANT: Keep safe a back-up of the calibration tables on your computer

Calibration tables are needed by the microcontroller on board to translate frequency CAT commands into tune capacity values.

SCR Preselector-CAT comes calibrated from factory. Whenever the user can do recalibration with the aid of the calibration tables for each band.

The SCR Preselector-CAT program folder contains five documents so-called

table_BAND_A.txt

table_BAND_B.txt

table_BAND_C.txt

table_BAND_D.txt

table_BAND_E.txt

table_BAND_F.txt (*Table_Band_F do not need be changed due it is a non tunable BPF*)

The tables link the operating frequency with the tuning capacity value, comprised between 0 and 511 maximum. That value can be read on Tune Reference Dial (8)

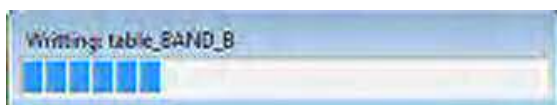
The column on the left is the capacity value, on the right the frequency related in MHz.

With the aid of a reference frequency or receiver, values in the calibration tables can be modified. **Up to 64 reference points** can be added to the list. Intermediate values in the table are computed by the microcontroller on board.

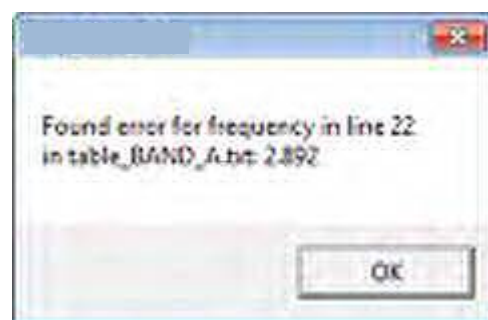
To calibrate, tune the preselector at maximum reference frequency or background noise on your receiver; enter in the table the capacity value shown in the Tune Reference Dial (8) and the reference frequency from your RF generator or receiver dial. Frequency must be expressed in MHz.

Next, calibration tables must be updated into the microcontroller; function key "F5" opens the message box.

Capacity	Frequency (MHz)
460	2.487
450	2.488
440	2.517
430	2.538
420	2.559
410	2.580
400	2.601
390	2.622
380	2.644
370	2.685
360	2.707
350	2.735
340	2.763
330	2.791
320	2.812
310	2.861
300	2.889
290	2.918
280	2.946
270	2.981
260	3.016
250	3.044
240	3.079
230	3.121
220	3.157
210	3.199
200	3.241
190	3.311
180	3.361
170	3.410
160	3.459
150	3.515
140	3.572
130	3.635
120	3.747
110	3.825
100	3.895
90	3.973
80	4.057
70	4.148
60	4.209
50	4.394
45	4.451



Updating calibration tables.



After update close the program and open again. The microcontroller on board resets, starts again and reads the new calibration tables.

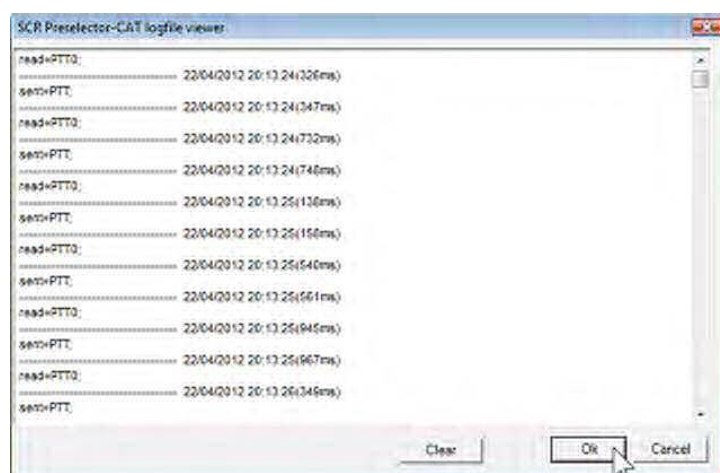
If writing tables a syntax error occurs a warning message is show when the program is open again.

Logfile. Function key F6

A Logfile is generated each time that the SCR Preselector-CAT application is opened . It is helpful to diagnosis purposes.

Function key "F6" opens the Logfile.

Also the file can be found in the program folder as Log.txt.



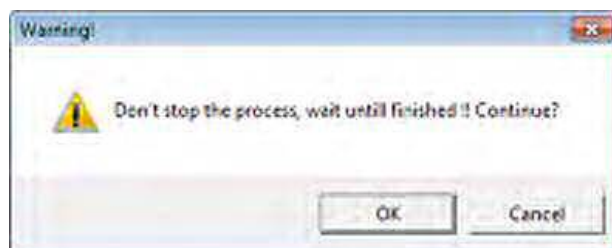
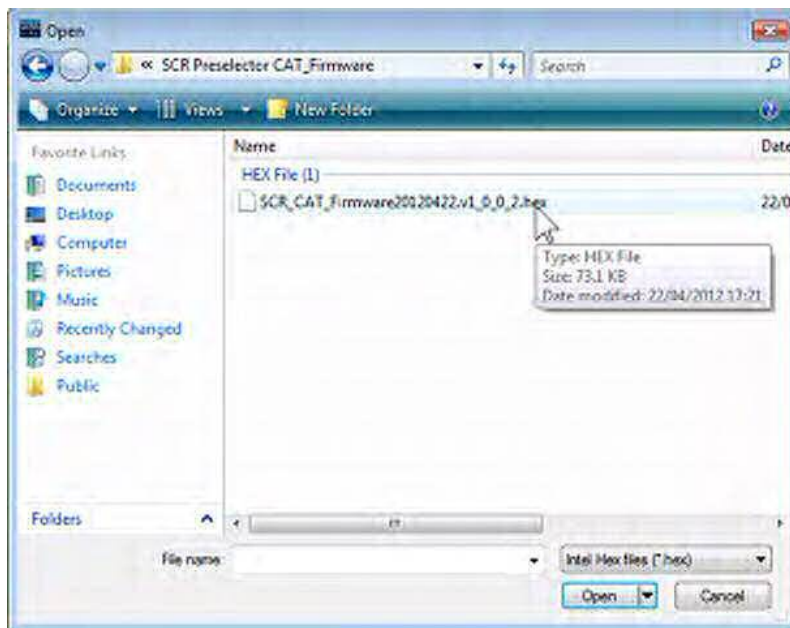
Firmware update. Function key F7

To update the on board microcontroller firmware, Function key "F7" pops-up the dialog window.

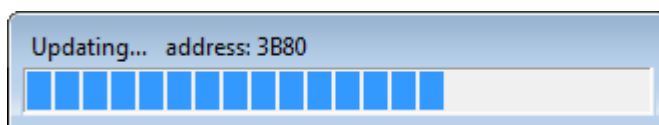
Select SCR_CAT_Firmware20120422.v1_0_0_2.hex file, located in the program folder.

WARNING! Do not stop the process, wait until finished.

IMPORTANT: After update write calibration tables.



Updating the Firmware



Remember write calibration tables

Internet/Local network remote control

The SCR Preselector-CAT supports connections via the Internet and Local network. To make use of this feature execute the application on your computer and on a remote one. The protocol only uses TCP/IP; UDP which by definition is unreliable is not used.

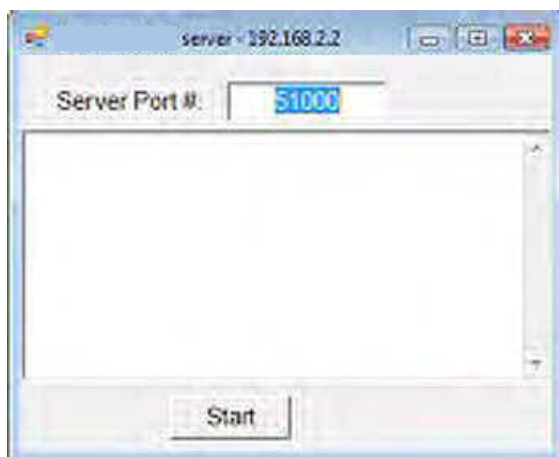
Remember that you are accepting incoming TCP/IP connections so you must configure your firewall on your PC and on external hardware firewall. See details below.

Remote server (preselector side) Function key F9

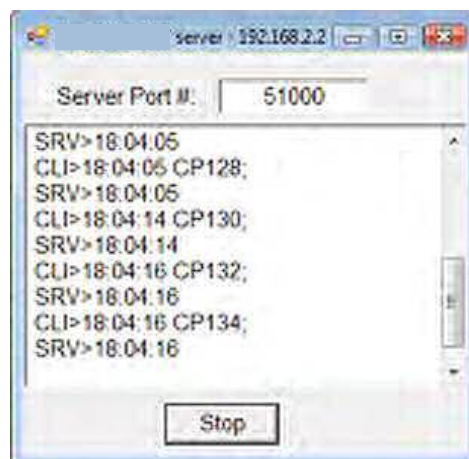
To start the communication open first the Remote Server, Function key "F9".

The connection console is displayed showing the address in dotted format of the computer where the server is running and the port number, default port 51000.

Click on Start button. If the connection is successful you will start to receive commands from the client computer, current commands are traced on the console. The SCR Preselector-CAT will respond in accordance with valid CAT commands.



Remote Server console

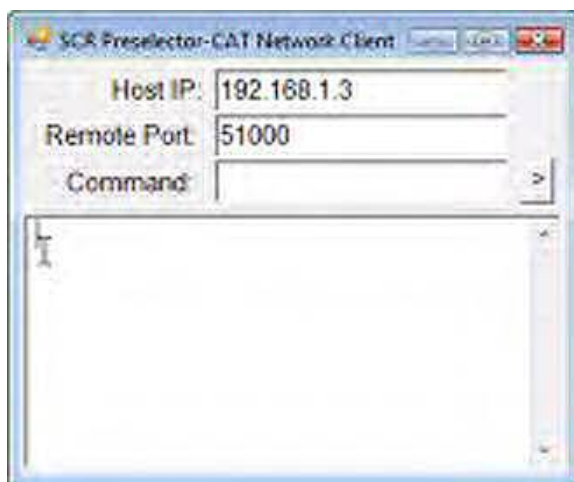


Receiving data from the Remote Client

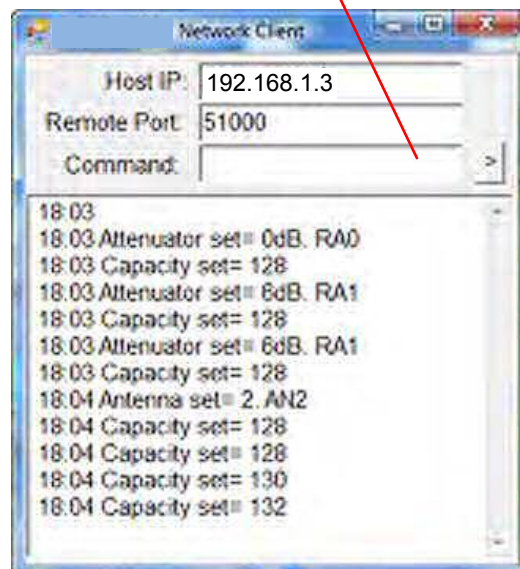
Remote Client (remote control side) Function key F8

To connect to the server make sure the server is started and is listening. Open the Remote Client, Function key "F8".

The connection console is displayed showing the default address in dotted format of the host computer and the port number, default port 51000. Enter the Host IP address in the text window and start operating the SCR Preselector-CAT application. Executed commands on the GUI are traced on the console. Also valid CAT commands can be send from the text box.



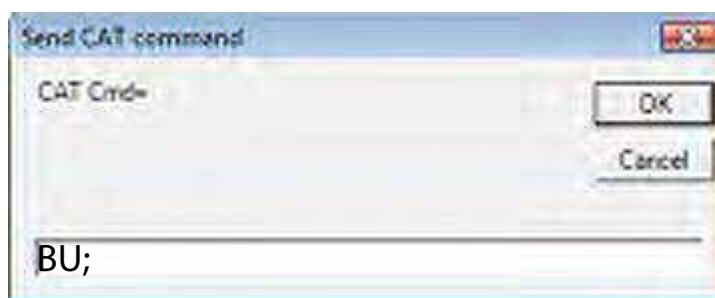
Remote Client console



Sending data to the Remote Server

Send CAT command. Function key F10

Let send valid CAT commands for testing purposes.



Network Configuration

Public IP Address.

To make your SCR Preselector-CAT Remote server visible to the outside world you must have a public IP address; this is an address that is reachable on the global Internet. Some ISP's assign public addresses which may change from time-to-time; this is known as a dynamic IP address.

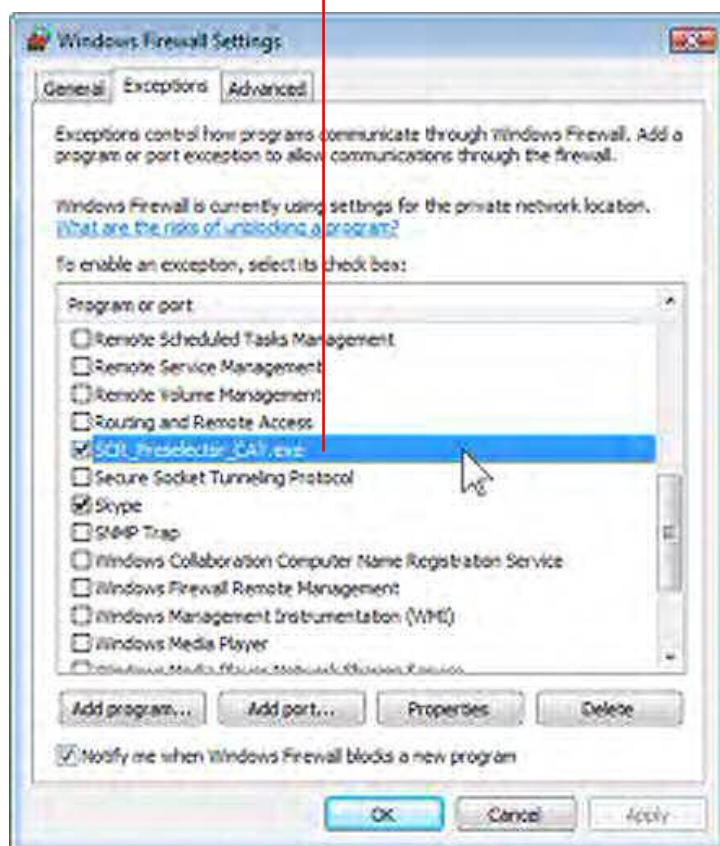
Firewall configuration

You must allow incoming TCP/IP connections on the port number selected in the Remote server's Console, by default this port number is 51000. You may have more than one firewall activated on your router and Windows Firewall. If the Windows firewall is enabled then when you start the



Unblock

Windows Firewall



Anti-virus.

Make sure you do not have anti-virus software inspecting and/or blocking TCP/IP traffic on the server port.

Port Forwarding

As well as allowing incoming TCP/IP connections on port 51000 you must route connections on this port to the computer where the server is running, this is known as Port Forwarding.

Depending on your router configuration software this may be referred to as Firewall> Virtual Servers, Port Forwarding, Forwarding - Virtual Servers, etc.

The screenshot below is from a Belkin router.



	Enable	Description	Inbound port	Type	Private IP address	Private port
1.	<input checked="" type="checkbox"/>	SCR Preselector-	51000 - 51000	TCP ▾	192.168.2.2	51000 - 51000
2.	<input type="checkbox"/>			TCP ▾	192.168.2.	
3.	<input type="checkbox"/>			TCP ▾	192.168.2.	
4.	<input type="checkbox"/>			TCP ▾	192.168.2.	

CAT remote control. Kenwood TS-2000 compatible.

CAT (Computer Aided Transceiver), serial data communication protocol over Virtual Com Port (VCP) enables SCR Preselector-CAT to provide the user with a way to interface with several radios. The user can track the SCR Preselector-CAT from remote control software applications.

Refer to your specific radio software application manual regarding CAT operation.

The SCR Preselector-CAT acts as a passive listener translating valid CAT commands into specific instructions. The microcontroller on board performs valid Kenwood TS-2000 compatible CAT commands.

Starting in CAT remote control mode.

The preselector GUI application must be closed before interface with any remote control software.

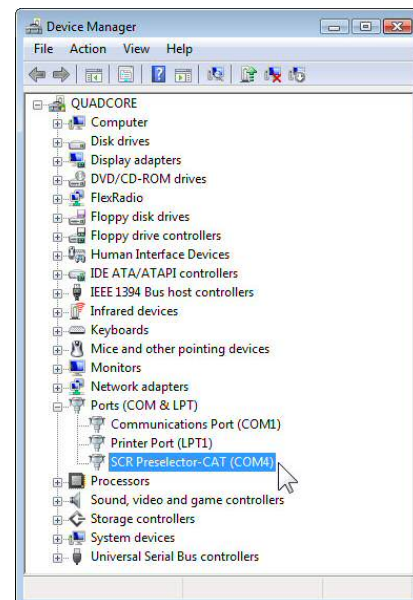
Power-On the preselector and plug the USB cable, a new virtual COM port is open; start and configure your application to control remotely the preselector.

Warning:

If you are working with Windows 7 and specially Windows 7 /64 bits O.S. it is highly recommended to upgrade to Windows 8.

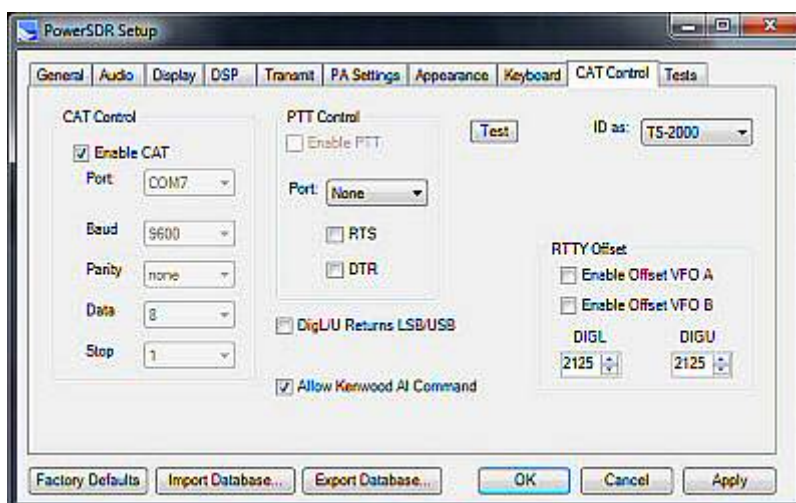
COM ports are a limited resource and must be managed properly or the whole radio system could be severely compromised. Any unnecessary activity should be avoided in favor of avoid saturate the ports.

Experimental and/or beta Radio Control Programs should be avoided.



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CAT configuration console on PowerSDR

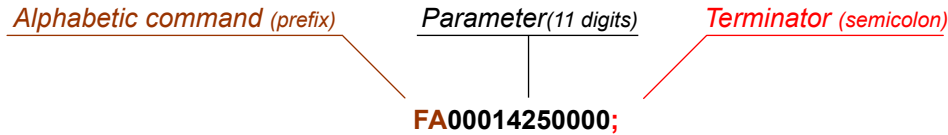


CAT control commands list (Kenwood 2000 compatible)

CAT CONTROL COMMANDS. General information.

A CAT control command is composed of an alphabetical command, parameter, and the terminator that signals the end of the control command.

EXAMPLE: Command to set tune frequency to 14.250 MHz



There are three command categories: Set (write) command that change preselector status, Get (read) command that request status information from the preselector and Answer (response) command that return information requested in a Get command.

A correctly executed Set command does not return an Answer command.

The terminator for all CAT commands is the semicolon (;). CAT commands are not case sensitive. Get and Set commands must contain the correct number of parameter characters as shown below. Get commands are simply the prefix followed by a termination.

SCR Preselector-CAT. Available CAT commands.

Band commands: prefix BNx (x band number, 1 digit ;). SET commands

BN0;	By-Pass
BN1;	Band A
BN2;	Band B
BN3;	Band C
BN4;	Band D
BN5;	Band E
BU;	Band-up
ZZBU	(PowerSDR)
BD;	Band-down
ZZBD;	(PowerSDR)
BN;	(answer: BNx; where x is the band number) request information about Band status. GET command.

Frequency commands: prefix FA (band number, 11 digit ;). frequency in Hz. SET commands.

FA000xxxxxxx;	(e.g. 3.8MHz FA00003800000, e.g. 21.315MHz FA00021315000)
ZZFA;	(PowerSDR)
FA;	(answer FA000xxxxxxx;) request information about frequency status. GET command.

Antenna commands: prefix ANx (x antenna number, 1 digit ;). SET commands.

AN1;	antenna 1.
AN2;	antenna 2
AN;	(answer ANx; where x is the antenna number) request information about antenna status. GET command.

Attenuator commands: prefix RAXx (xx attenuator number; 2 digit ;). SET commands.

RA00;	attenuator 0dB
RA06; or RA01;	attenuator 6dB
RA12; or RA02;	attenuator 12dB
RA18; or RA03;	attenuator 18dB
RA;	(answer RAXx; where xx is the attenuator value) request information about attenuator status. GET command.

Preamplifier commands (LNA): prefix PAX (x antenna number, 1 digit ;). SET commands.

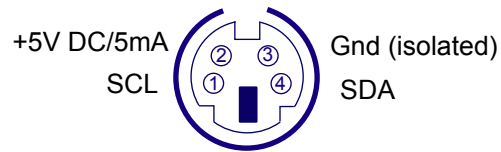
PA0;	Preamplifier OFF
PA1;	Preamplifier ON
ZZPA;	(PowerSDR)

Tune capacity commands: (non standard Kenwood) prefix CPxxx (xxx capacity value (pF.), 3 digit ;). SET commands.

CPxxx;	(e.g. CP210; set capacity to 210pF, e.g. CP009; set capacity to 9pF).
CP;	(answer CPxxx; where xxx is the capacity value in pF.) request information about tune capacity status. GET command.

External I2C Bus lines

4 ways mini-Din socket connector pin-out



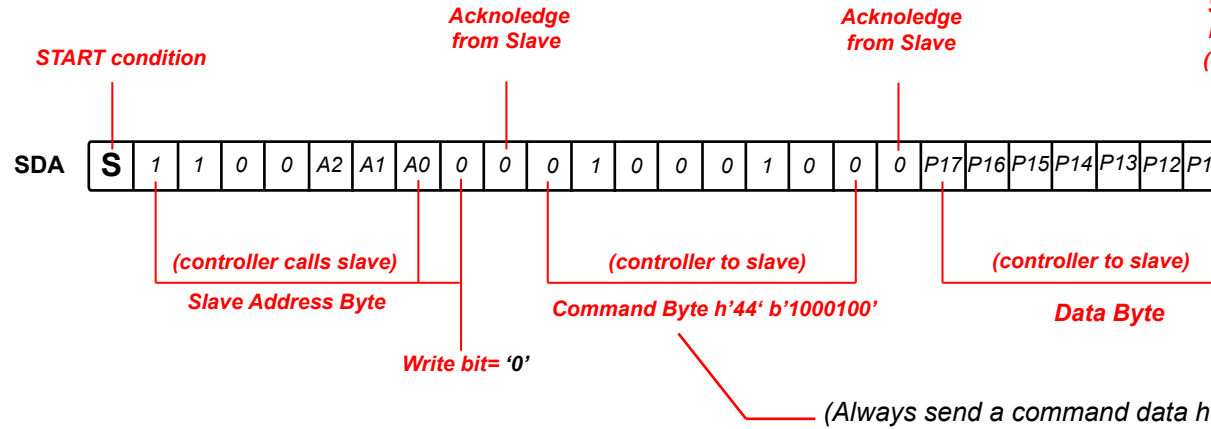
(Front view)

In order to switch to I2C remote control mode first program the I2C addresses on GUI, Context menu, I2C slave's address (Function key F4).

Go to LCD main menu, Functions selection knob (2), and pick "3. I2C Mode". The preselector remains on that remote control mode until other control mode is selected.

I2C Bus remote control implementation

Writing sequence to slaves.



1st slave:
I2C address: 1100 A2 A1 A0

bit	Relay	Action
0	RL13	Tune Cap 1pF
1	RL14	Tune Cap 2pF
2	RL15	Tune Cap 4pF
3	RL16	Tune Cap 8pF
4	RL17	Tune Cap 16pF
5	RL18	Tune Cap 32pF
6	RL19	Tune Cap 64pF
7	RL20	Tune Cap 128pF

2nd slave:
I2C address: 1100 A2 A1 A0

bit	Relay	Action
P10 - RL21		Tune Cap 256pF
P11 - RL11, RL12		Band F
P12 - RL9, RL10		Band E
P13 - RL7, RL8		Band D
P14 - RL5, RL6		Band C
P15 - RL3, RL4		Band B
P16 - RL1, RL2		Band A
P17- RL23,24,30		By-Pass

3rd slave:
I2C address: 1100 A2 A1 A0

bit	Relay	Action
P00	RL2	
P01	RL2	
P02	RL2	
P03	RL2	
P04	RL2	
P05	NO	
P06	NO	
P07	NO	

NOTES:

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