

NN4ZZ CwSkimmer and SDR-Bridge setup – A quick start guide

Revision History

14-Jun-2014 - added Telnet screen
11-Aug-2014 - added additional notes about SmartCat and DAX control panel
20-Jan-2015 - update version numbers and added troubleshooting notes
21-Jan-2015 - Added troubleshooting note about BLIND mode
6-Feb-2015 - Added "contents", added screen shots, reorganized
9-Feb-2015 - Added notes about the Reverse Beacon Network
15-Feb-2015 - update SDR-Bridge version, additional troubleshooting notes
15-Mar-2015 - Added SDR-Bridge setup screen, note on skimmer audio tab
17-Mar-2015 - Added notes for SDR V1.4 changes
11-Apr-2015 - Added "output sample rate" error note
18-Feb-2016 - Added new version info and more troubleshooting tips
25-Mar-2017 - Added CW Skimmer Left/right channel troubleshooting tip
7-Jun-2017 - Added RBN setup notes from Andy / KU7T

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Document Overview

This goal for this document is to help you get started with the CW Skimmer and SDR-Bridge setup. The capabilities of each program are extensive, this document will not attempt to address all of them. It is recommended that you start by getting just one instance of CW skimmer running with SDR-Bridge and then explore the possibilities and capabilities of each program. The setup is not difficult but there are a number of minor things that can cause problems. In addition to the recommended settings for each program, there is a troubleshooting section that can help if you run into difficulty.

Regards, Al / NN4ZZ - email: Al (at) nn4zz (dot) com

Version information for SDR-Bridge, DAX control panel and CWSkimmer.

- CW Skimmer – Version 1.8.3.350
- SDR-Bridge – Version 1.5.0.123

Note this version of SDR-Bridge will work with SDR Version V1.3 and later.

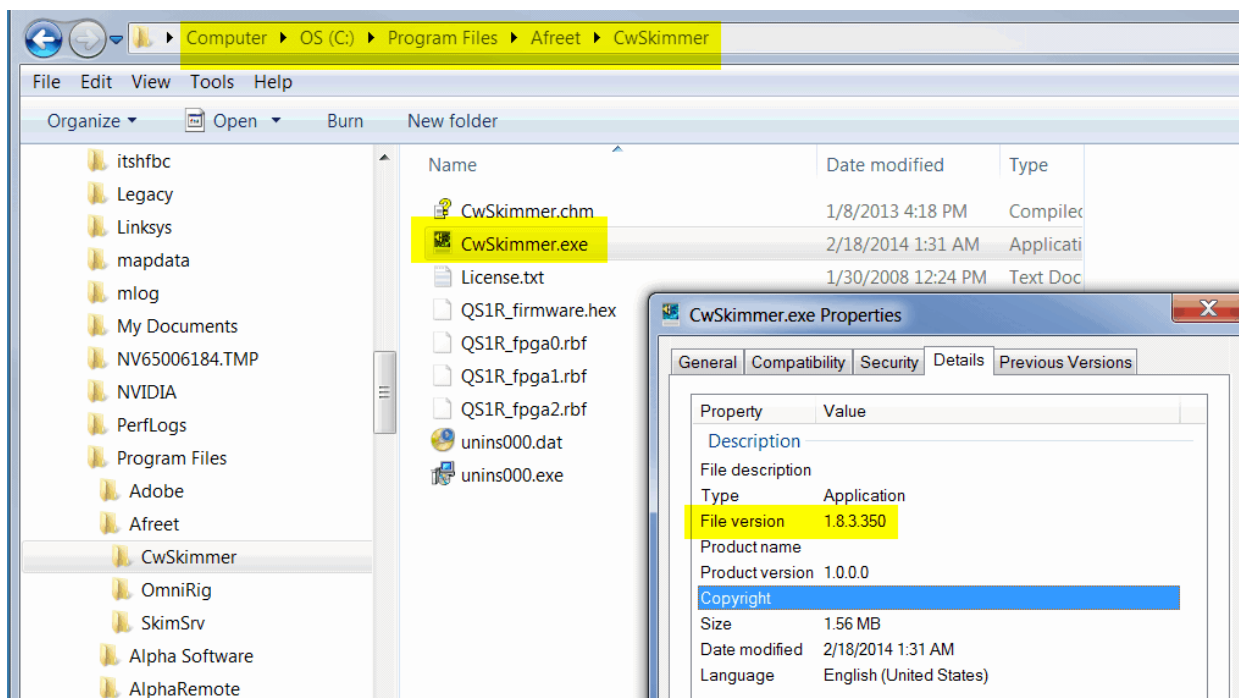
- SmartSDR - Version 1.3.8.126 or later
- DAX Control - Version 1.3.8.126 or later

CwSkimmer

Note: **check the version using the file properties**, it is not on the CWSkimmer screen. Navigate to the ProgramFiles/Afreet/CWSkimmer folder using file manager.

Down load and install the latest version of CwSkimmer into the default directory. This should be V1.8.3.350 or later.

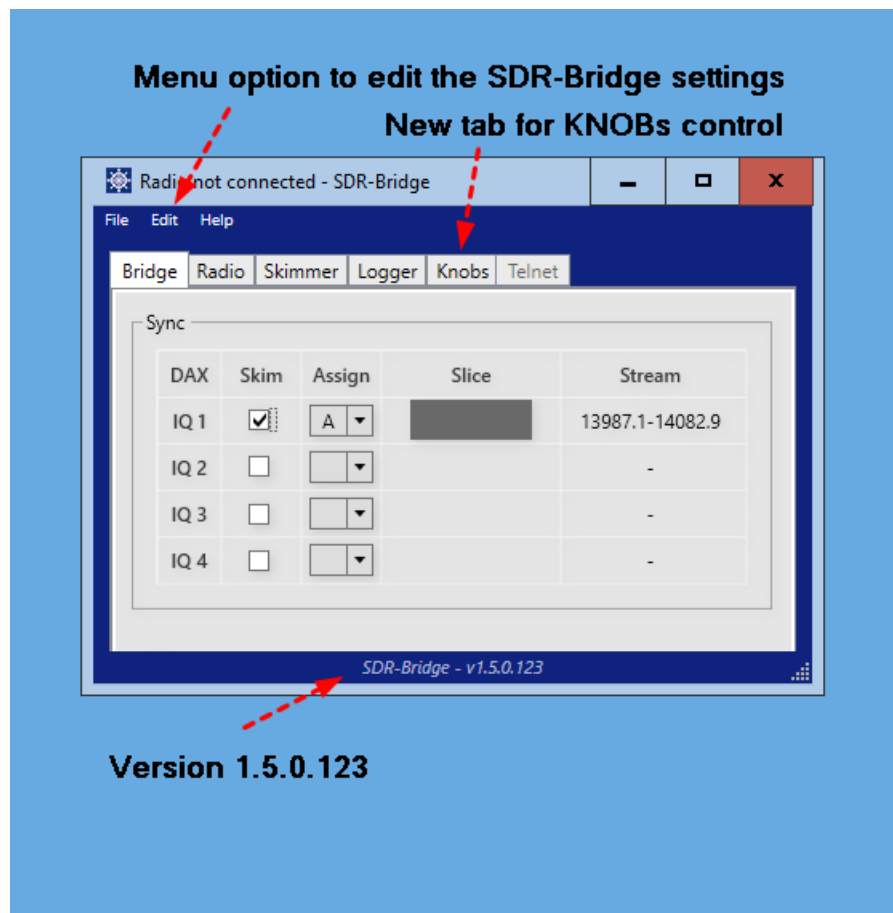
<http://www.dxatlas.com/CwSkimmer/>



SDR-Bridge

Down load and install SDR-Bridge from:

<http://www.qrv.com/sdrbridge.html>



Note: The **Telnet port in CW Skimmer** must match the port shown here. For example IQ1 is 7310. See the CW Skimmer telnet port setup later in the document. NOTE: If you are using to feed the Reverse Beacon Network, see the notes starting on page 28 regarding the ports and call setup

If you need to reset the values in this screen to the defaults, the process is described in the troubleshooting section.

The screenshot shows the 'SDR-Bridge Settings' window. At the top, there are two checked options: 'Feature set: Full' and 'Always on top'. Below this is a section titled 'Skimmer assignment' which contains a table with four columns: DAX, Host, Port, and Call. The table lists four entries: IQ 1, IQ 2, IQ 3, and IQ 4. Each entry has a corresponding 'Path' field below it. At the bottom of the window is a section titled 'App paths' with two fields: 'Skimmer' and 'WriteLog'.

DAX	Host	Port	Call
IQ 1	localhost	7310	F1EX
IQ 2	localhost	7320	F2EX
IQ 3	localhost	7330	F3EX
IQ 4	localhost	7340	F4EX

Path: %allusersprofile%\W2RF\IQ1.ini

Path: %allusersprofile%\W2RF\IQ2.ini

Path: %allusersprofile%\W2RF\IQ3.ini

Path: %allusersprofile%\W2RF\IQ4.ini

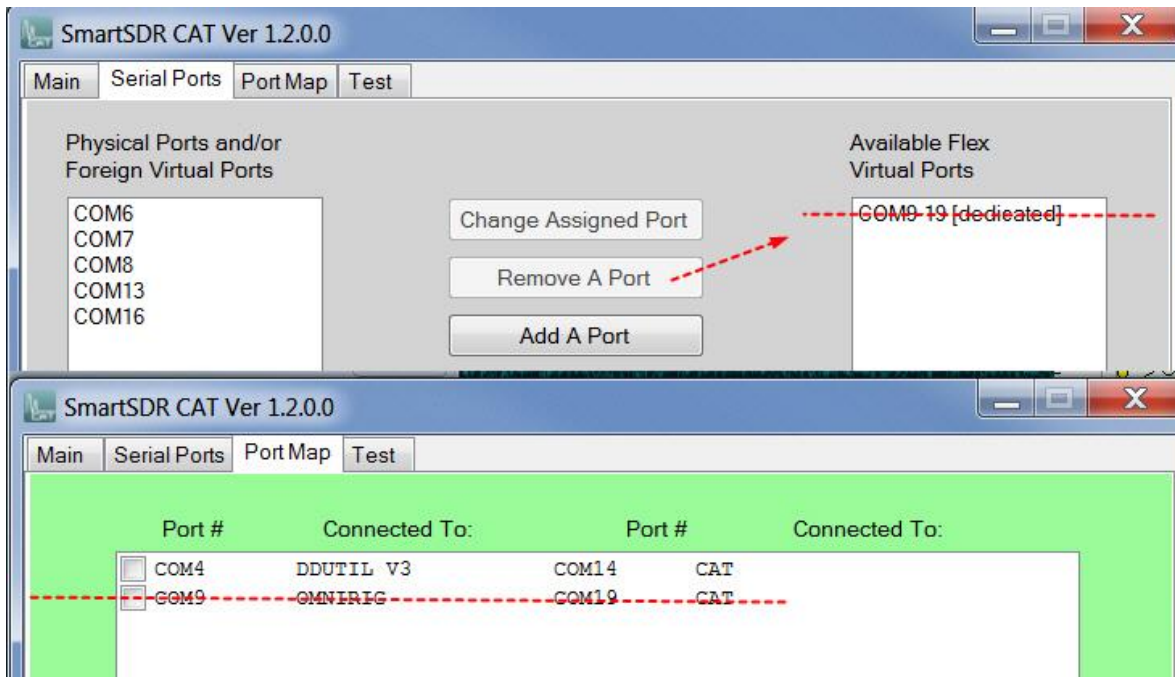
App paths

Skimmer: %programfiles%\Afrete

WriteLog: %programfiles%\WriteLog

SmartCat

SmartCat is **not needed any longer** for CW Skimmer when using SDR-Bridge. If you previously used it before SDR-Bridge, it is no longer necessary to setup a dedicated port for OmniRig. SDR-Bridge connects directly to the radio. If you have a port setup, you can delete it.



SmartSDR

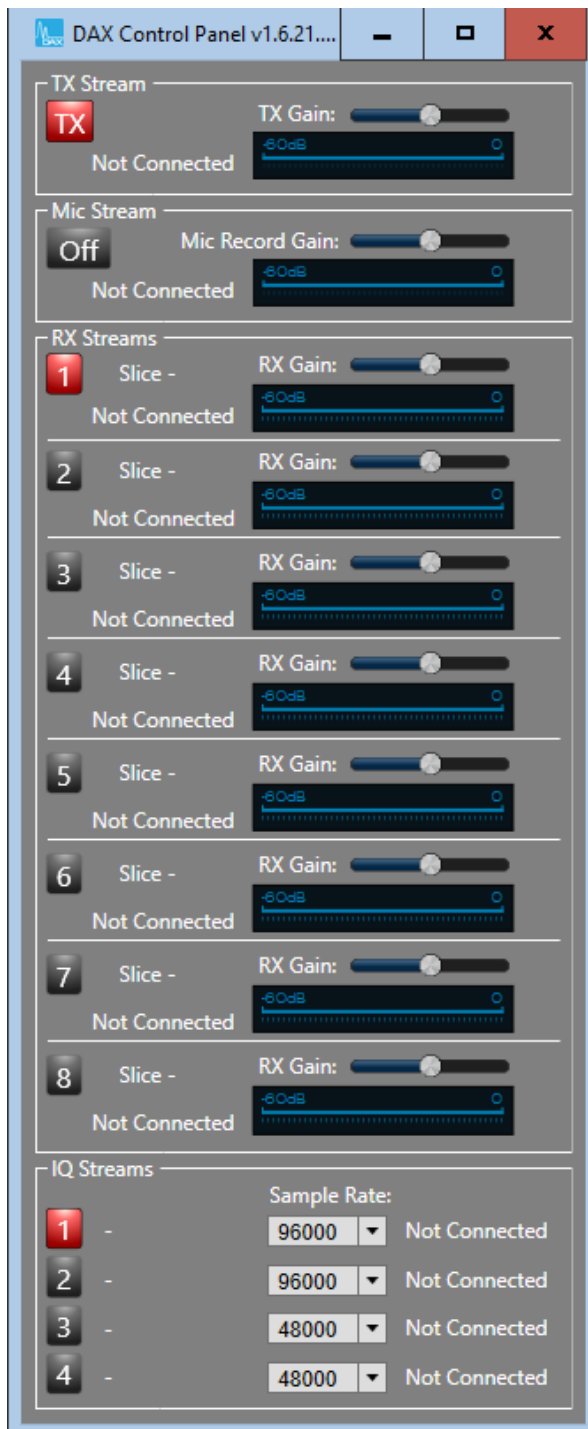
Set the DAXIQ channel.

Note: The DAX settings in the SLICE are not used for CW Skimmer, only the DAX IQ setting on the left side of the SSDR screen is used.



DAX control panel

The control panel should look like this:

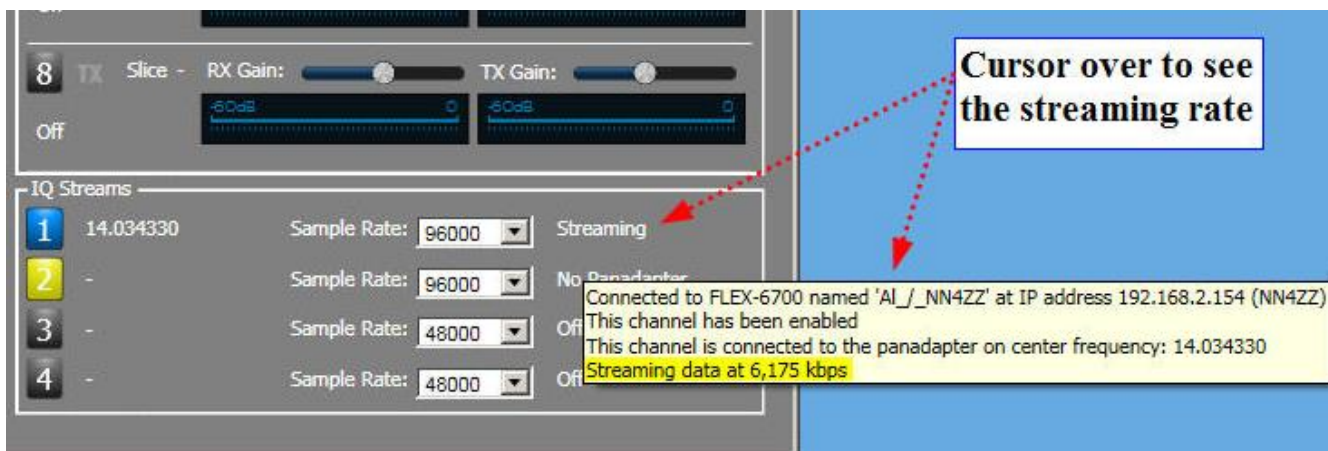


The only DAX setup needed for CW Skimmer is the IQ stream. To enable the DAXIQ channel, click the button for the channel you are using to **ENABLE** the channel, it should turn **BLUE**. Set the Sample rate to 96000. Note: if you are using CWS to feed the Reverse Beacon Network see notes starting on page 28 about the sampling rate.

Note about the **FREQUENCY** displayed in the DAX control panel. It is the **center frequency of the PANADAPTER**, **not** the frequency of the slice receiver.



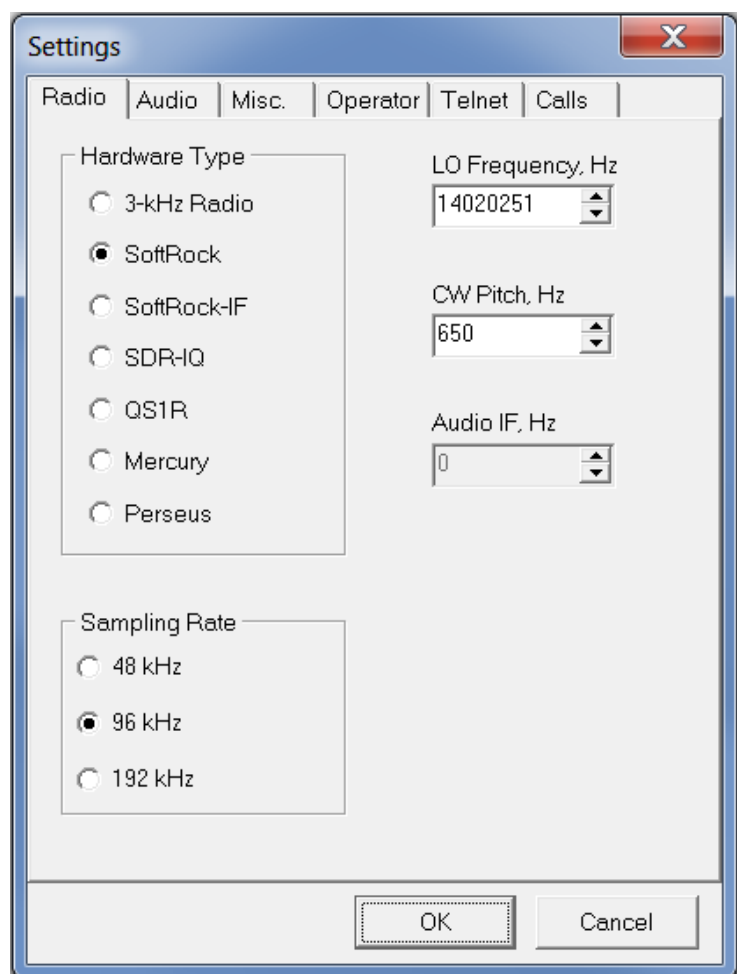
Starting in DAX V1.4 the RATE:value is replaced with the word "Streaming" when running. You can see the rate by hovering the cursor.



CW Skimmer Setup

Radio – SoftRock, Sampling 96KHZ, CW Pitch to match SmartSDR

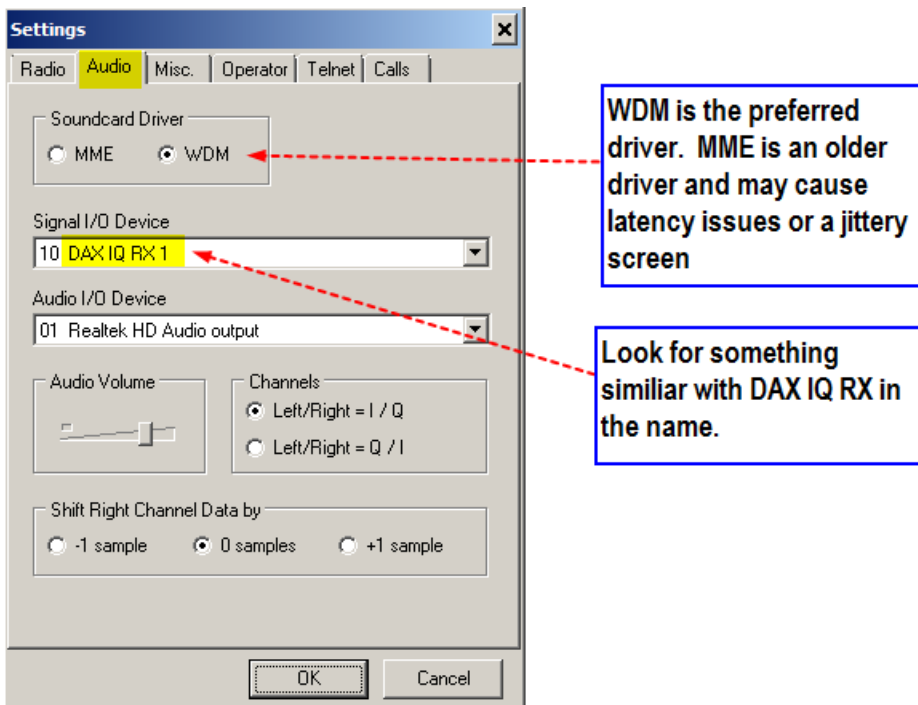
RADIO Tab



The screenshot shows the 'Settings' dialog box with the 'Radio' tab selected. The 'Hardware Type' section has radio buttons for '3-kHz Radio', 'SoftRock' (selected), 'SoftRock-IF', 'SDR-IQ', 'QS1R', 'Mercury', and 'Perseus'. The 'LO Frequency, Hz' is set to 14020251. The 'CW Pitch, Hz' is set to 650. The 'Audio IF, Hz' is set to 0. The 'Sampling Rate' section has radio buttons for '48 kHz', '96 kHz' (selected), and '192 kHz'. At the bottom are 'OK' and 'Cancel' buttons.

Hardware Type	LO Frequency, Hz	CW Pitch, Hz	Audio IF, Hz	Sampling Rate
<input type="radio"/> 3-kHz Radio	14020251	650	0	<input type="radio"/> 48 kHz
<input checked="" type="radio"/> SoftRock				<input checked="" type="radio"/> 96 kHz
<input type="radio"/> SoftRock-IF				<input type="radio"/> 192 kHz
<input type="radio"/> SDR-IQ				
<input type="radio"/> QS1R				
<input type="radio"/> Mercury				
<input type="radio"/> Perseus				

Audio settings – your DAX IQ device may be named slightly different.



Note: Do NOT set the Audio I/O device to the same device as the Signal I/O device. This will cause issues. It should be set to one of your PC audio playback devices.

Telnet screen

The screenshot shows a 'Settings' dialog box with a blue title bar and a close button. It has several tabs: 'Radio', 'Audio', 'Misc.', 'Operator', 'Telnet', and 'Calls'. The 'Telnet' tab is selected. The dialog contains several settings:

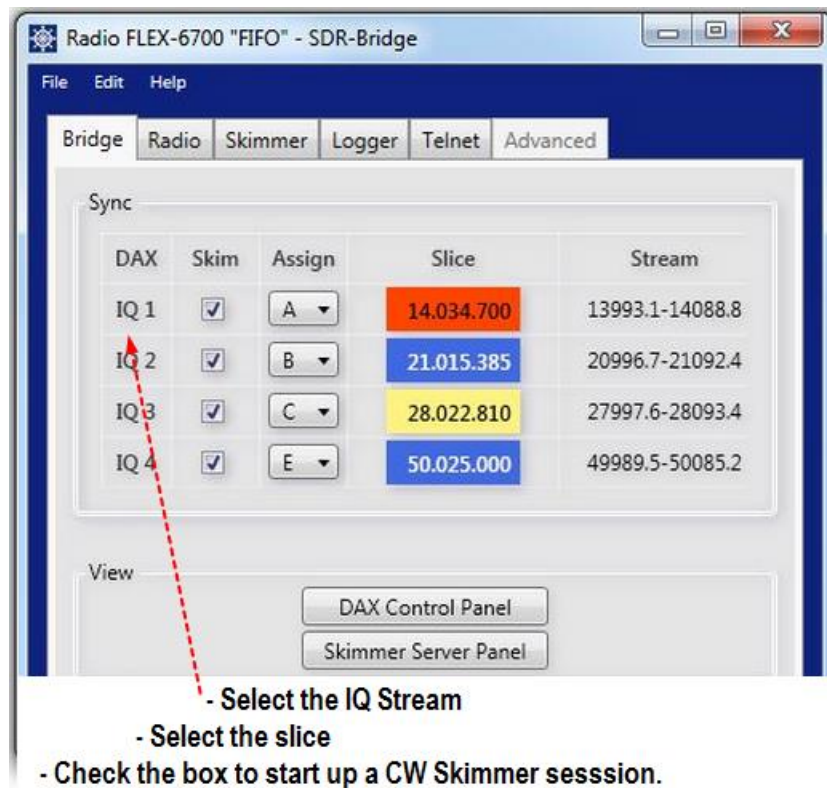
- ☒ Enable Telnet Server
- Port: 7310 (with a spin button)
- ☐ Require Password
- Password: [text box]
- ☐ Do not send callsigns without "CQ"
- ☒ Allow SKIMMER commands
- ☐ Only to/from this User: [text box]

At the bottom are 'OK' and 'Cancel' buttons.

Using SDR-Bridge

Snapshot shows 4 CW skimmers set up. Start your testing with just one.

Select IQ1, select a slice (e.g. Slice A), check the SKIM box to start up a skimmer session.



NOTE: There are options on the Radio and Skimmer tabs that affect how the program operates. Also starting V1.1.1 there are options you can set by RIGHT clicking on the frequency. To get started you can just use the defaults. Review the official SDR-Bridge documentation to see what works best for the way you operate.

CW Skimmer screen during K1N DXpedition.



Troubleshooting notes:

- Verify the versions of SDR-Bridge, CW Skimmer, and DAX control panel. It is easy to get an older copy loaded that will probably not work. It's also easy to launch an older copy since you may have multiple versions on your PC. Reminder, once V1.5 of SmartSDR is released the older versions of SDR-Bridge will not work, be sure you have the latest version of SDR-Bridge running.
- If there is no data being sent to CW Skimmer, check to be sure the DAX IQ channel is set.

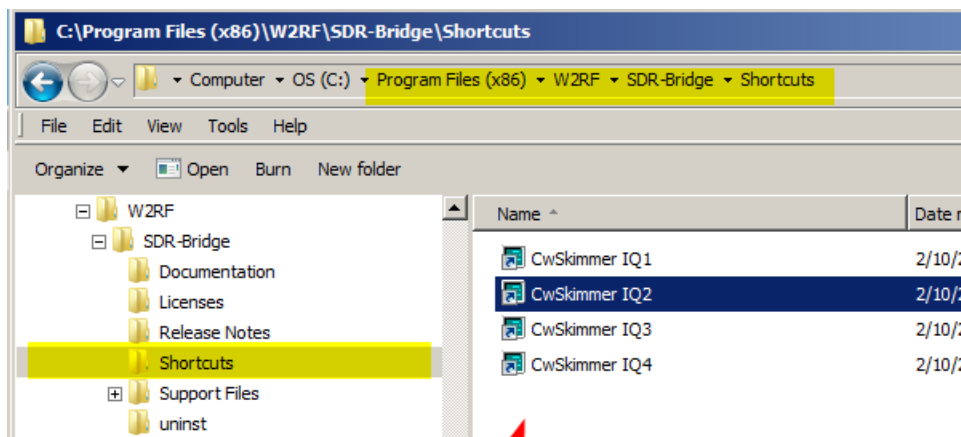


- The DAX control panel settings can be flaky. You may have to un-click and re-click the IQ Stream BLUE button to get data flowing. The “signal device” in the CW Skimmer Audio tab is another place to check. The source should say DAX IQ RX1 or similar.

- Sometimes the CW Skimmer instance needs to be manually closed and re-opened to start working. It may even be hard to close (give errors) and have to be stopped with the task manager. Usually after closing the skimmer it will start up normally from the check box in SDR-Bridge.
- Win 10 users – it has been reported in one case SDR-Bridge and CWS were working fine but stopped transferring IQ data on just one of the IQ channels. After much checking no cause was found but a PC reboot corrected the issue.

- Sometimes CW Skimmer will not start from the check box in SSDR. Or the skimmer may come up with a black screen or otherwise error out. In this case you can manually start one (or more instances) of CW Skimmer before launching SDR-Bridge by using one of the shortcuts provided here:

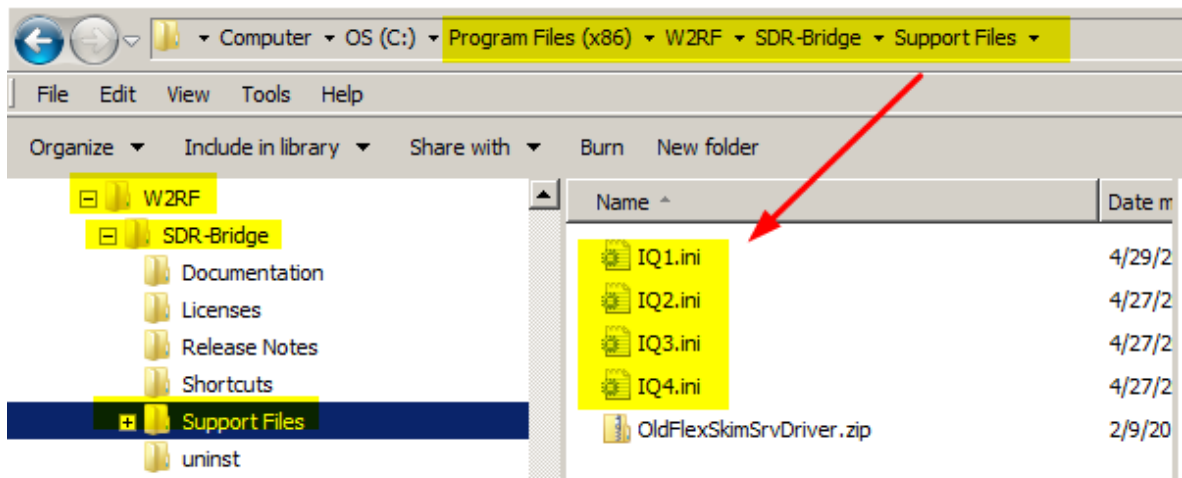
By using one of the shortcuts Ed provides it will start up using the correct IQx.ini file. Here is where they are located. You can copy and paste them to the desktop for quick access.



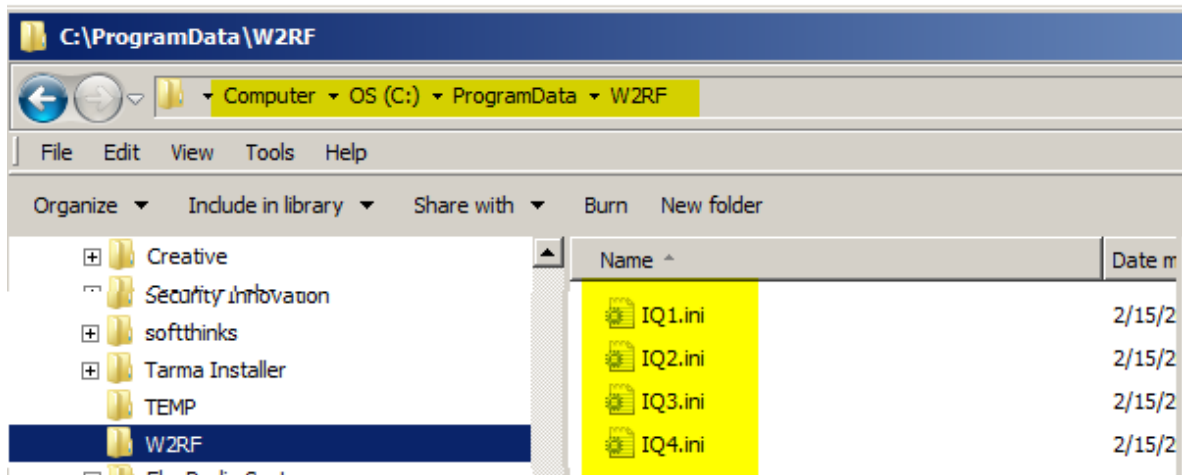
You can use these shortcuts to start up copies CW Skimmer even before starting SDR-Bridge if CW Skimmer instance won't start from SDR-Bridge.

- If skimmer is up but not displaying the calls and other data, be sure to check the TELNET settings tab on CW Skimmer. Be sure they match the telnet settings in SDR-Bridge. Also check program versions.
- If the SDR-Bridge settings are wrong, or get set wrong, you can reset them to the defaults by doing the following. **To restore default settings, delete the contents of [user]\appdata\local\w2rf.**

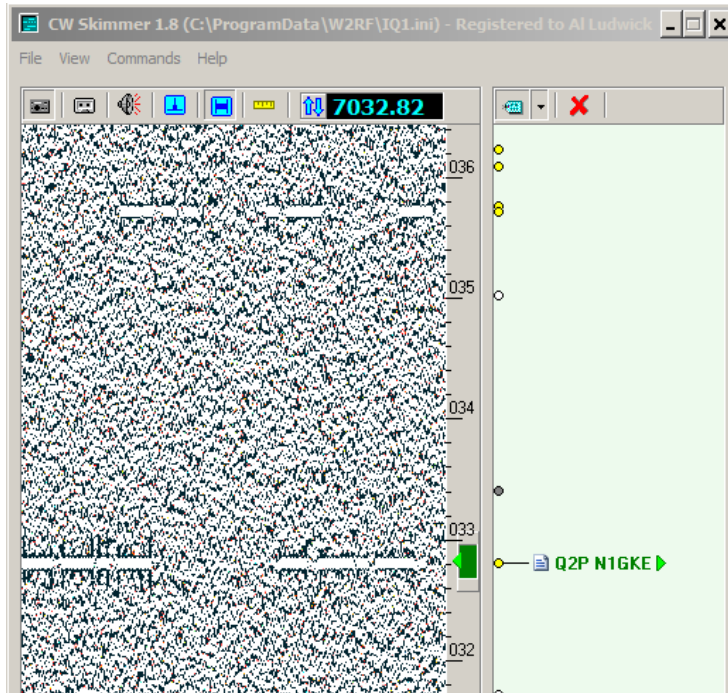
- If the skimmer frequency is slightly off from the slice receiver, check to see if your CW Skimmer CW Pitch matches the pitch setting in SmartSDR. Be aware that Skimmer currently may be off a bit due to the granularity for synching. This will be corrected in a future version of CW Skimmer.
- Sometime the Skimmer does not display the same frequency data as your slice receiver. You can often re-synch them by shaking the slice receiver. (click and hold in the panadapter and move side to side)
- Sometime the Skimmer .ini file get corrupted by changing settings. If you suspect this is the problem you can overwrite them with a fresh copy the Ed provides. See the snapshot below to show where to get the fresh copy and where to paste it to overwrite the corrupted copy.



Copy to the "program data" folder.

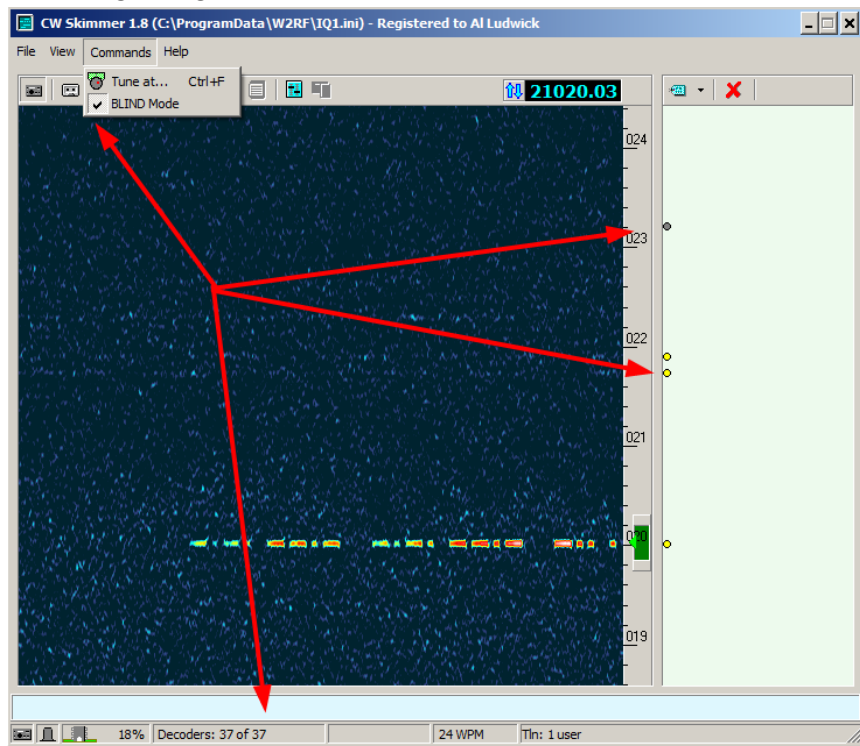


- If CW Skimmer is displaying but it looks bad, check to verify that the sample rate in the DAX Control panel isn't set to 48,000.

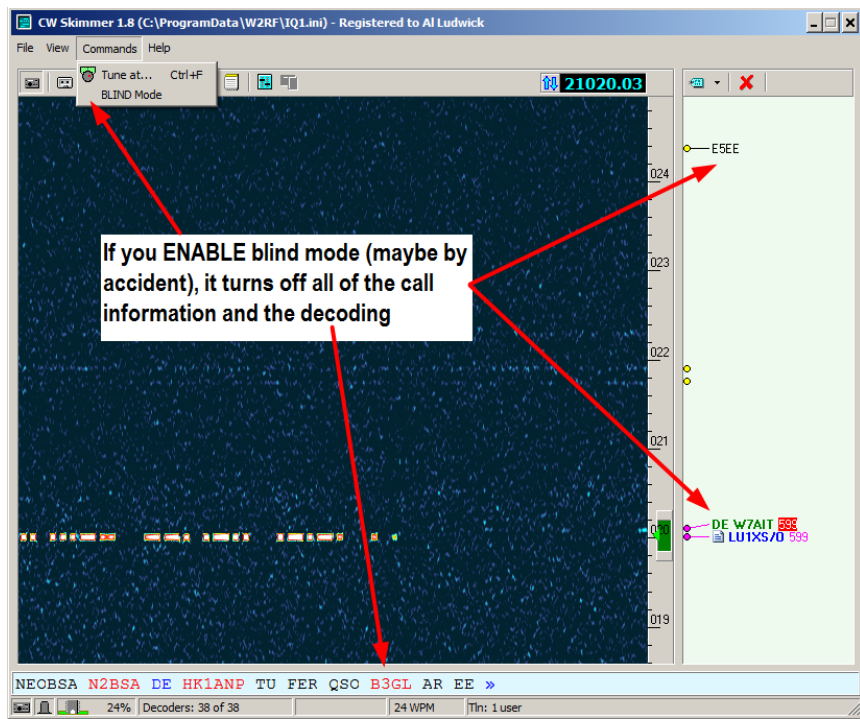


- If your CW Skimmer screen doesn't show the call information or decoded text you may have accidentally ENABLED BLIND mode. You will see the frequency displayed, the code steam, and the "dots" but NO text.

BLIND MODE = ON

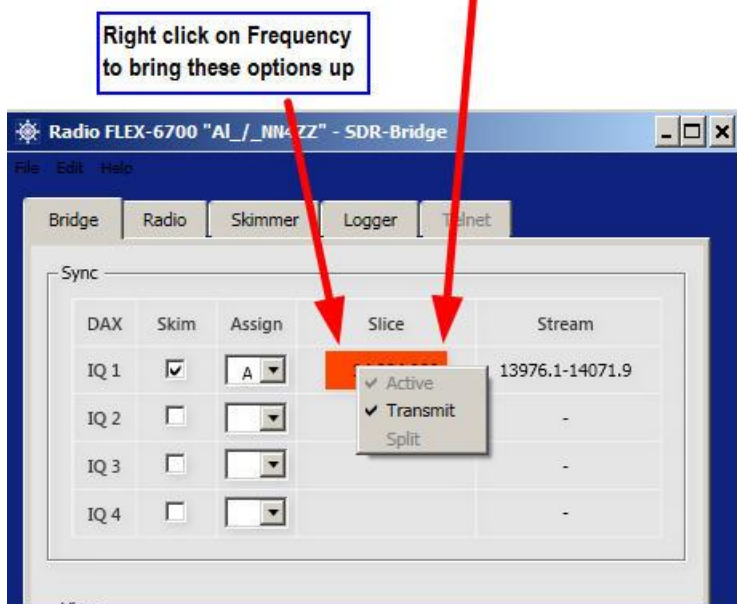
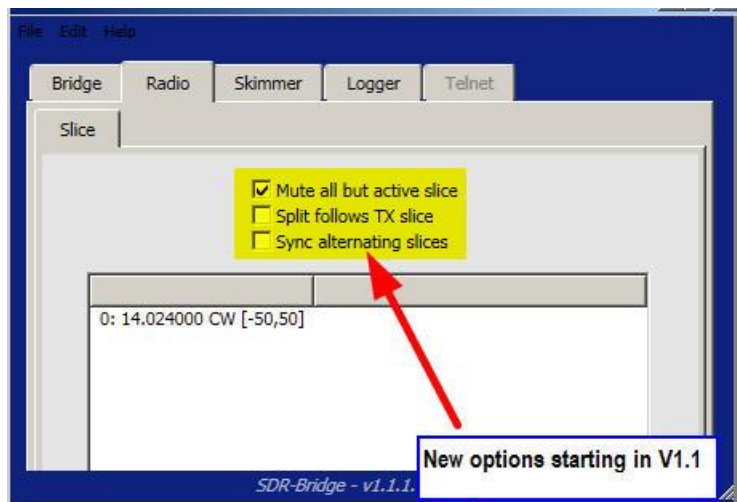


BLIND MODE = OFF

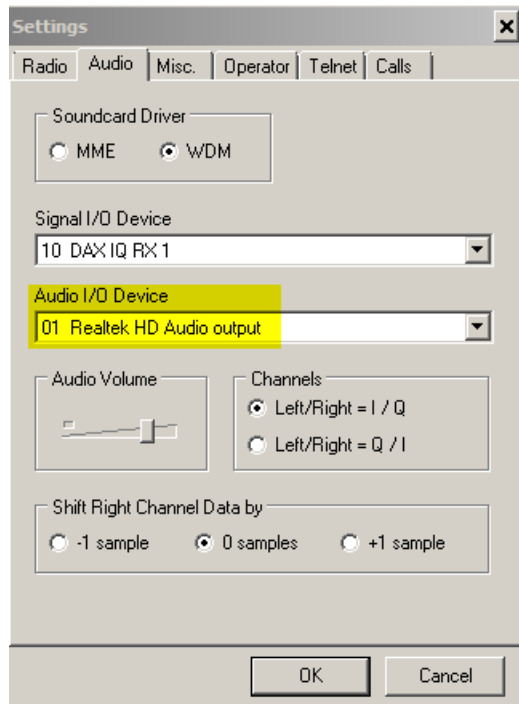


- There are some new options for working split on SDR-Bridge starting in V1.1.1. If you notice some things like muting or TX Active working differently, take a look at the new options to see if you need to make changes for your operating style.

The changes are on the BRIDGE tab and the RADIO tab.



- When CW Skimmer starts up you get this continuously repeating error: **Output sample rate out of range.**
Check the CW Skimmer **Audio I/O Device** on the Audio tab of the CW Skimmer settings. It should **NOT** be set to the same device as listed in the **Signal I/O Device**. Typically it is set to your audio output device but you may have to try some other settings.



- Several users of CW Skimmer have reported that the following error message appears on program startup:

"Access violation at address 00404DD3 in module CwSkimmer.exe. Read of address 00000000."

The error occurs only on those systems where the Skimmer was installed using a regular user account on Windows, with standard privileges. The installer has to put some executable files in the Program Files folder, and some data files in the user data folder. Since the regular users are not allowed to write to Program Files, the installer runs as Administrator. As a result, the data files are placed in the administrator's data folder, not in the user's folder. This is how MS designed their security system, and this cannot be bypassed.

To fix the problem, log in as Administrator and copy the data files from admin's folder to your user's folder. For example, if your admin name is AlexAdmin, and your regular user name is AlexUser, then you copy all files from this directory

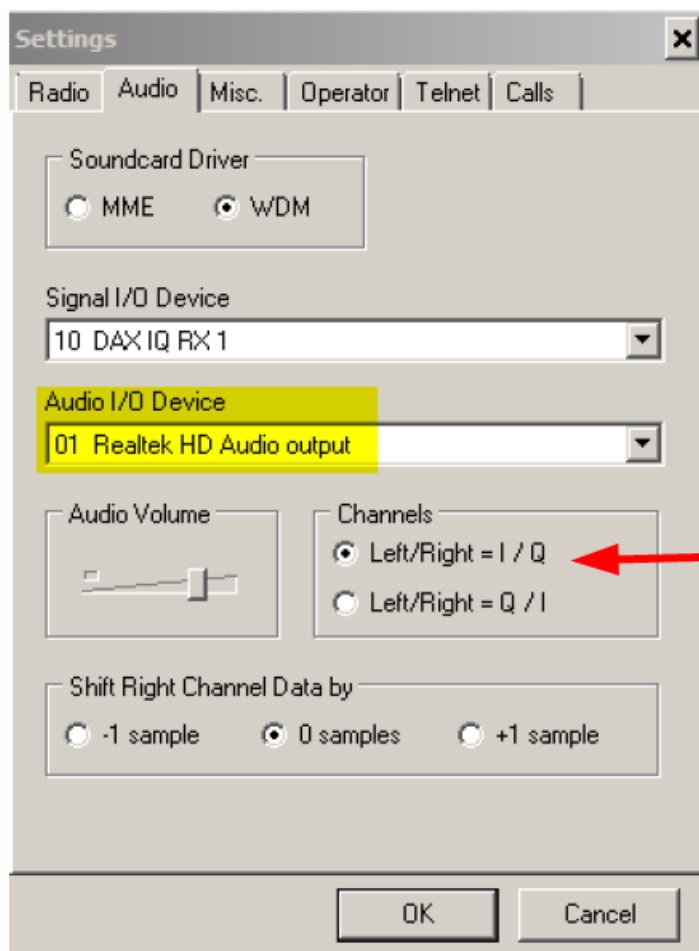
C:\Users\AlexAdmin\AppData\Roaming\Afrete\Reference

to this one:

C:\Users\AlexUser\AppData\Roaming\Afrete\Reference

Chuck / W9WLX reported this issue. All frequencies sync and follow--the slice receiver, SDR Bridge and the TX frequency on CW Skimmer. If I set the TX frequency on skimmer to the center frequency of the DAX IQ stream, it works as expected. However, if I change the slice frequency, off the center stream frequency, it shifts in the opposite direction. For example, if my center stream frequency is 7.020 and I double click on a station at 7.022 on the Skimmer waterfall, the slice receiver will follow and go to 7.022, however the station is really at 7.018.

The problem was the “left / right” channel was set up incorrectly in the CQ Skimmer Audio panel. It should be set to I / Q.



Reverse Beacon Network – works with SDR-Bridge

If you aren't familiar with the Reverse Beacon Network see the link on the next page for a short history.

The aggregator software

This software receives spots from CW Skimmer or Skimmer Server's telnet port, and sends the spots to the Reverse Beacon Network.

[rbn aggregator v3.0.exe](#)

Microsoft .NET framework version 4 must be installed

For more information about using the RBN aggregator, please read:

[Using Aggregator 10.pdf](#)

The following notes provided by Tom WQ5O and he reports that it is working fine.

- Load the SDR-Bridge first, and setup 4 slices. Then started the aggregator. In the Secondary Skimmer box in the aggregator insure the ports in the aggregator match the ports for the different slices in Bridge. Click "connect skimmer" for each slice and it will connect. The primary skimmer also connected when I started aggregator.
- You have to check the DAX control panel to insure you're running 96K for the IQs. A - 96K, IQ1; B - 96K, IQ2, etc.
- There is a place in the aggregator to add your call sign for each skimmer so that it'll show correctly in the RBnetwork. It also seems to adjust the frequency offset automatically when you get the entire thing set up.

It's not hard to set up but there are several steps that you have to make sure are correct or the skimmers won't display the correct info. The DAX IQs have to match the correct slices in the different skimmers. The DAX IQs have to be set at 96K or the skimmers won't display the correct info.

They SDR-Bridge and Reverse Beacon Aggregator work well together from what I see. I had 4 skimmers running yesterday most of the day and they produced a lot of traffic for the RBN.

Here is a screen shot of the RBN and some additional information on the RBN

Click link for the WELCOME page of the Reverse Beacon Network

<http://www.reversebeacon.net/index.php>

Click link for a short history of the Reverse Beacon Network.

<http://www.reversebeacon.net/pages/A+Short+History+12>

Typical DX screen with a filter applied for the recent K1N DXpedition.

REVERSE BEACON NETWORK

welcome | main | dx spots | nodes | downloads | about | contact us

[show/hide my last filters](#)

showing spots for DX call: K1N

search spot by callsign

rows to show: 100 ▼

de	dx	freq	cq/dx	snr	speed	time
W3OA	K1N	14023.0	CW CQ [LoTW]	7 dB	32 wpm	1911z 09 Feb
W8WWV	K1N	14023.1	CW CQ [LoTW]	32 dB	32 wpm	1911z 09 Feb
K8ND	K1N	14023.1	CW CQ [LoTW]	23 dB	32 wpm	1911z 09 Feb
PJ2T	K1N	14022.9	CW CQ [LoTW]	20 dB	32 wpm	1911z 09 Feb
WA7LNW	K1N	14023.0	CW CQ [LoTW]	14 dB	31 wpm	1911z 09 Feb

options:
[show/hide](#)

K1N frequencies on last 15 minutes:
20m: 14023 - 39 spots
17m: 18070 - 9 spots
12m: 24899 - 9 spots

[Donate](#)

we have 124 skimmers online
skimmers online:
9V1RM -
AA4VV -
40m,17m,12m,20m,15m,30m,10m
AC0C -
BA5CW - 40m
BD7RS -
BG3LPA -

These RBN setup notes below were provided by Andy / KU7T

The host and port settings in SDRBridge need to point to the CWSkimmer port. If you do run both the bridge and CWSkimmer on the same PC, then the settings should be “localhost” and “some port”. That port needs to match. The call in the SDRBridge can be anything, **but it cannot have any special characters in it**. For example do not use KU7T-1. Suggestion is to use your legal licensed call.

SDR-Bridge Settings

Feature set: ☒ Full ☒ Always on top

Skimmer assignment

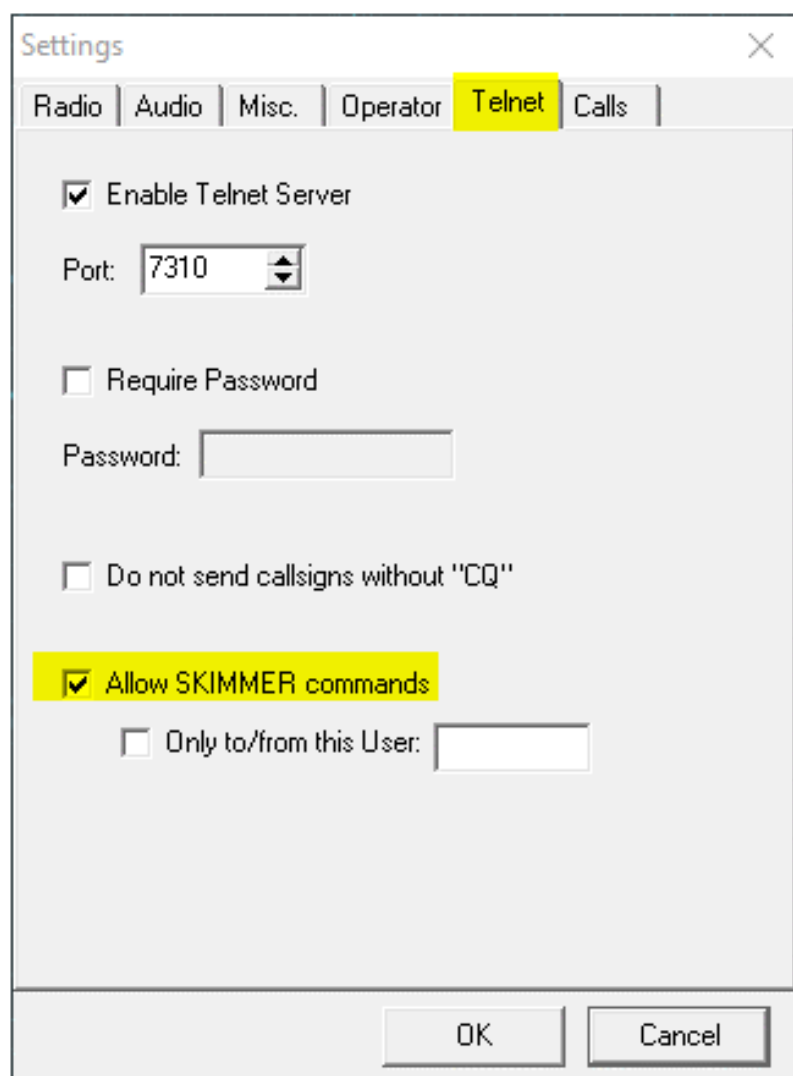
DAX	Host	Port	Call
IQ 1	localhost	7310	KZ0ABC
Path: %allusersprofile%\W2RF\IQ1.ini			
IQ 2	localhost	7320	KZ0ABC
Path: %allusersprofile%\W2RF\IQ2.ini			
IQ 3	localhost	7330	KZ0ABC
Path: %allusersprofile%\W2RF\IQ3.ini			
IQ 4	localhost	7340	KZ0ABC
Path: %allusersprofile%\W2RF\IQ4.ini			

App paths

Skimmer: %programfiles%\Afrete

WriteLog: %programfiles%\WriteLog

In CWSkimmer, “Allow skimmer commands” needs to be checked.

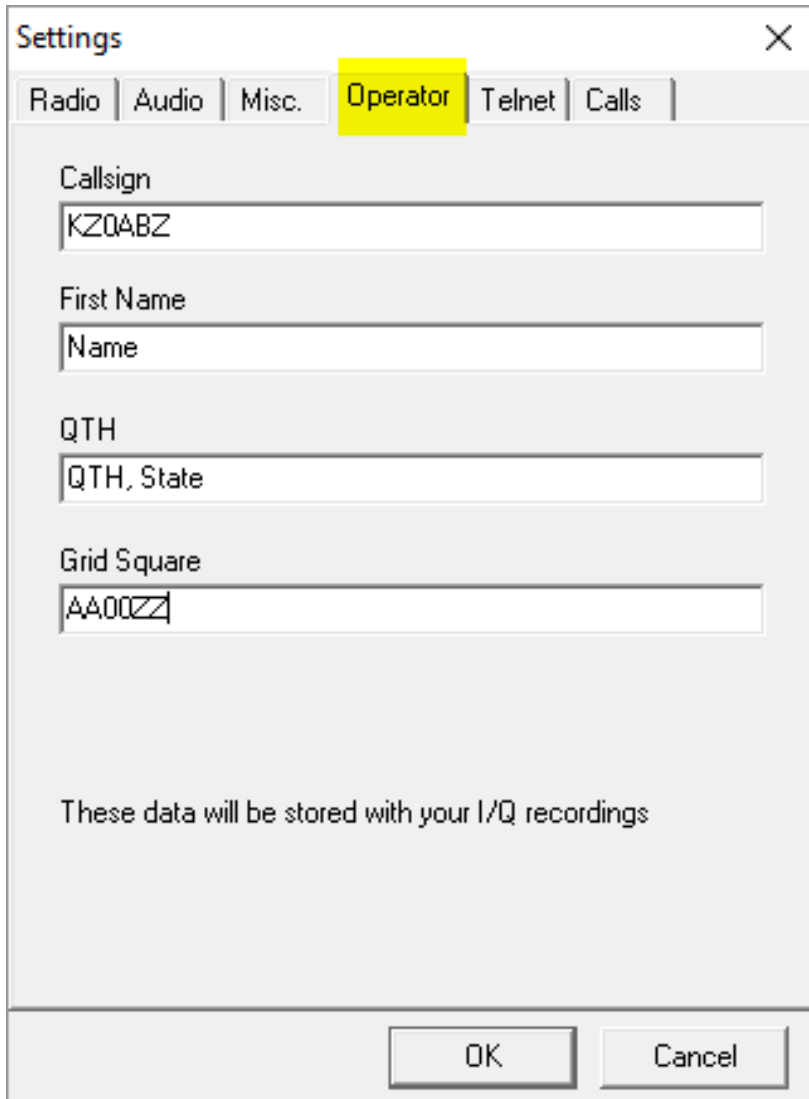


The image shows a screenshot of the 'Settings' dialog box in CWSkimmer, specifically the 'Telnet' tab. The dialog box has a title bar with 'Settings' and a close button. Below the title bar are several tabs: 'Radio', 'Audio', 'Misc.', 'Operator', 'Telnet' (which is selected and highlighted in yellow), and 'Calls'. The 'Telnet' tab contains the following settings:

- ☒ Enable Telnet Server
- Port: 7310 (with a spin button)
- ☐ Require Password
- Password: (empty text field)
- ☐ Do not send callsigns without "CQ"
- ☒ Allow SKIMMER commands (this line is highlighted in yellow)
- ☐ Only to/from this User: (empty text field)

At the bottom of the dialog box are two buttons: 'OK' and 'Cancel'.

The call sign in the CW skimmer dialog will be the call sign of the station that the spots will be originating. In most cases, this will also be your own valid call sign. (In some rare cases, you may want to add a /call area, i.e. KU7T/7, if there is already another skimmer online with the base call sign.)



The image shows a 'Settings' dialog box with a close button (X) in the top right corner. The 'Operator' tab is selected and highlighted in yellow. The dialog contains four text input fields: 'Callsign' with the value 'KZ0ABZ', 'First Name' with the value 'Name', 'QTH' with the value 'QTH, State', and 'Grid Square' with the value 'AA00ZZ'. Below these fields is a note: 'These data will be stored with your I/Q recordings'. At the bottom are 'OK' and 'Cancel' buttons.

Radio	Audio	Misc.	Operator	Telnet	Calls
Callsign KZ0ABZ					
First Name Name					
QTH QTH, State					
Grid Square AA00ZZ					
These data will be stored with your I/Q recordings					
OK Cancel					

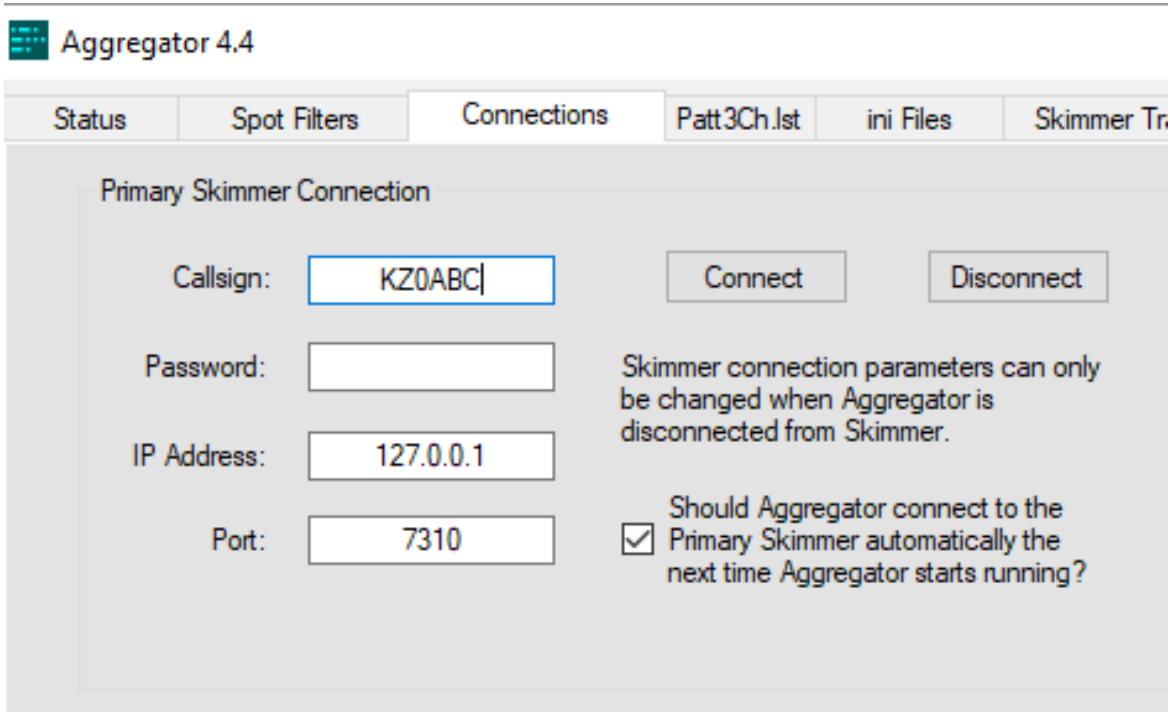
By doing this, you can recognize your own spots in your logging software.

Available - 38 Mults 62 Qs of 64 total spots

Mults & Qs				Bands & Modes					
	160	80	40	30	20	17	15	12	10
Mults	0	0	12	7	17	1	1	1	0
Qs	0	0	24	7	28	2	1	1	0
Total Qs	0	0	24	7	30	2	1	1	0

Call	Freq	Dir	Mode	Mult?	S/N	Time v	Spotter
VE6TL	10105.7	038°...	CW	Yes 1	38dB	0449Z	W7HR-#
VK2GR	10107.8	244° #	CW	Yes 1	12dB	0448Z	K3PA-#
F6CEL	7008.9	037°...	CW	Yes 1	19dB	0448Z	K1TTT-#
KJ7LB	7028.9	131° #	CW	Yes 1	25dB	0448Z	VE7AB-#
UR6I	14030.7	018° #	CW	Yes 1	13dB	0447Z	W3LPL-#
9A2TN	10107.0	029° #	CW	Yes 1	31dB	0447Z	W3LPL-#
NA5G	21019.4	123° #	CW	Yes 1	24dB	0447Z	N7TR-#
W7WHO	14005.9	131° #	CW	Yes 1	17dB	0447Z	WA7LN...
W5VX	7003.1	123° #	CW	Yes 1	39dB	0446Z	VE3EID-#
HB9HFA	7006.6	033° #	CW	Yes 1	12dB	0445Z	WZ7I-#
EA5DNO	7001.4	044°...	CW	Yes 1	08dB	0445Z	K1FC-#
UA6BRD	14258.0	013°	USB	Yes 1		0445Z	K6MTS
W9ZN	7030.0	092° #	CW	Yes 1	44dB	0445Z	K1TTT-#
K9DP	14052.0	092° #	CW	Yes 1	07dB	0444Z	KP3Z-#
WD5BZN	7025.8	123° #	CW	Yes 1	15dB	0444Z	W3OA-#
RW3XZ	14010.0	013° #	CW	No	06dB	0444Z	W4KKN-#
W1NA	7010.8	079° #	CW	Yes 1	17dB	0444Z	WZ7I-#
OE6MBG	14213.0	029°	USB	Yes 1		0444Z	K2RD
YL2BJ	14028.6	018° #	CW	Yes 1	23dB	0444Z	W3LPL-#
F6FXX	7019.9	037°...	CW	Yes 1	25dB	0443Z	W1NT-#
KJ4EOO	10117.9	103° !	CW	Yes 1	12dB	0443Z	KU7T-#
IW2NBW	7025.1	032° #	CW	Yes 1	11dB	0442Z	N2QT-#
F2YV	7018.0	037°...	CW	Yes 1	18dB	0442Z	K1TTT-#
SP9FOW	14009.0	024° #	CW	Yes 1	36dB	0441Z	VE2WU-#
VE7UTS	14015.1	334°...	CW	Yes 1	07dB	0441Z	WA7LN...
IQ4FE/4	14013.1	032° #	CW	Yes 1	11dB	0441Z	AA4VV-#
LZ2CP	14023.9	024° #	CW	No	11dB	0441Z	WZ7I-#
OE1KRQ	7029.3	029° #	CW	Yes 1	14dB	0440Z	W3LPL-#
G0GKH	14019.7	034° #	CW	Yes 1	15dB	0440Z	WZ7I-#
SE1TDE	14022.1	021° #	CW	Yes 1	21dB	0440Z	WZ7I-#

(optional) You can also send your local spots to the RBN network for others to use. In this case you use the RBN aggregator to send the spots out, and then connect to your favorite cluster node which would then get you the spots back (with all the others). If you wanted to do that, you need to download the latest RBN aggregator software from www.reversebeacon.net, and configure it to connect to your local CW Skimmer. One or multiple (up to 8 skimmers are supported). In order to do that, the Aggregators setting must point to the CW Skimmer, IP Address and Port. The call sign again must be your legal call sign.



The screenshot shows the 'Aggregator 4.4' application window. The 'Connections' tab is selected, displaying the 'Primary Skimmer Connection' settings. The fields are as follows:

Field	Value
Callsign:	KZ0ABC
Password:	
IP Address:	127.0.0.1
Port:	7310

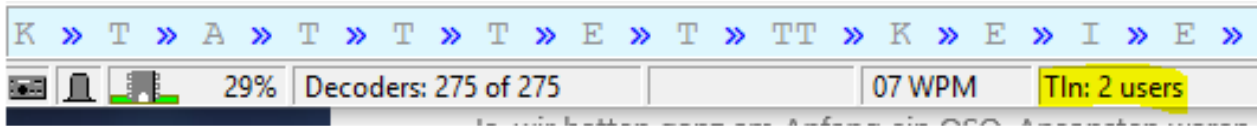
Buttons: 'Connect' and 'Disconnect' are located to the right of the Callsign field.

Text: 'Skimmer connection parameters can only be changed when Aggregator is disconnected from Skimmer.'

Checkbox: 'Should Aggregator connect to the Primary Skimmer automatically the next time Aggregator starts running?' is checked.

(optional) If you want to feed your logger with your locally skimmed spots AND a public cluster (but not send your spots to RBN), you need to combine these two feeds. A suggested tool is K1TTT's WintelnetX tool. You can think of it as a Y "connection" for cluster feeds. For example, you could connect to both VE7CC AND your local CW Skimmer feed, and output it on a local port. That port you would then connect your favorite logging program to it. (see screen shot above).

A good help for troubleshooting: In the status bar at the lower right corner of CW Skimmer you can see how many telnet users are connected. There must be at least 1 telnet user for SDRBridge. If you do not see 1 connected for the bridge, the settings in the bridge do not match. In case of you using RBN Aggregator (option 3), a second user will be connected for it. Or, if you just use the spots locally (option 3) you should also see a second user connected to it. There is no limit of how many telnet clients can connect to the CW Skimmer.



Note: It is also possible to both combine the feeds and send to RBN (options 2 and 3). In that case, a contester may have an advantage of getting the raw local spots without any filtering or delay from the RBN network. In that example, 3 telnet users would be connected.

SAMPLING RATE: I am able to run with 192khz sample rate, and therefore have more band coverage. As long as DAX and CW Skimmer are set to it, works fine. This is good because it seems the center frequency could be arbitrarily at the beginning of the band, i.e. 7.012, and if using 96 would only give me coverage to about 7.012 + 48. With 192, the whole band is covered...