# Preparations for using the IC-7610 with the HDSDR application

The IC-7610 (with firmware version 1.20 or later) can output the In-phase/Quadrature (I/Q) data that is processed by the FPGA. Connect [USB 2] to a PC's USB port, and you can control the IC-7610 from a PC using the HDSDR application.

# **Procedure outline**

To use the IC-7610's [USB 2] port as an I/Q port for the first time, follow the steps described below.

- ① For the settings and operations of HDSDR, see the document "IC-7610 HDSDR Operating Guide," which can be downloaded from the Icom website.
- ① Before you start using the IC-7610 with HDSDR, check the PC system requirements, as shown on page 2.

#### Step 1. Confirming the IC-7610 firmware version (See Section 13 of the IC-7610 Advanced manual.)

Confirm the IC-7610 firmware version is 1.20 or later.

① If the IC-7610 firmware version is 1.11 or earlier, download the latest firmware version from the Icom website, and update your IC-7610 to be compatible with the I/Q output.

http://www.icom.co.jp/world/support/

① See Section 13 of the IC-7610 Advanced manual for details on how to update.

## Step 2. Installing HDSDR

NOTE: First install HDSDR before installing "IC-7610 USB I/Q Package for HDSDR."

You can use HDSDR (freeware) as an SDR application.

Download HDSDR (Version 2.76a) from the HDSDR website and install it.

#### http://www.hdsdr.de/

① When using CW Skimmer, install the other required applications to suit your operating needs. (pp. 3 ~ 4)

① Icom does not offer technical support for your PC settings or any use of 3rd party applications.

#### Step 3. Installing "IC-7610 USB I/Q Package for HDSDR"

CAUTION: DO NOT connect the IC-7610 and a PC until the driver installation has been completed.

To control the IC-7610 from a PC using HDSDR, download "IC-7610 USB I/Q Package for HDSDR" from the Icom website, and install it.

#### http://www.icom.co.jp/world/support/

The package contains "ExtIO IC7610.dll" and an IQ driver.

The DLL file is normally saved in the same folder where HDSDR is installed as the default.

(Example: C:\Program Files\HDSDR)

 $\textcircled$  Install the package onto your PC. See pages 5 ~ 6 for installation details.

#### Step 4. Connecting the IC-7610 and a PC

Connect a USB 3.0 cable (User supplied) between the IC-7610's [USB 2] port and one of your PC's USB ports, and then turn ON the IC-7610.

This document describes only hardware connections.

#### Step 5. Using HDSDR

("IC-7610 HDSDR Operating Guide")

See "IC-7610 HDSDR Operating Guide" to use the application with the IC-7610. This document gives 4 examples to control the IC-7610 from a PC using the HDSDR application. (pp. 3 ~ 4)

#### TIP: Updating "IC-7610 USB I/Q Package for HDSDR":

If you already have the package installed, you can download the latest version and update it by doing an overwrite installation.

(p. 7 in this document)

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(pp.  $5 \sim 6$  in this document)

# System requirements

Use a PC that meets the system requirements as described below.

#### Minimum system requirements

Operating System	Microsoft <sup>®</sup> Windows <sup>®</sup> 10 (32/64 bit) Microsoft <sup>®</sup> Windows <sup>®</sup> 8.1 (32/64 bit) ① Except for Microsoft <sup>®</sup> Windows <sup>®</sup> RT Microsoft <sup>®</sup> Windows <sup>®</sup> 7 (32/64 bit) ① In this guide, the OSs are described as "Windows 10," "Windows 8.1," and "Windows 7."
USB ports	USB 3.0
USB cable	USB 3.0
Remarks	We recommend that you use the on-board sound chipset. The CPU may have a heavy load when an external sound device, such as USB audio converter, is used.

These are the minimum system requirements to use the IC-7610 with the HDSDR application. Depending on your PC environment (permanently running software such as antivirus software, peripheral devices, settings of OS and other software), the operation of the IC-7610 with the HDSDR application may not perform properly.

# **Operation notes**

- Before connecting or disconnecting a USB cable, turn OFF the IC-7610.
- Depending on the PC performance, OS, condition, speed, and so on, the USB audio may be interrupted, or control by the PC software may be delayed.
- If the CPU has a heavy load, the USB audio is easily interrupted. If the audio is interrupted, set a lower sampling rate in the HDSDR application or close other applications, if running.
- To operate your PC and peripheral devices, follow the instructions provided in their manuals.
- This USB I/Q Package is designed only for the IC-7610. Icom does not guarantee its use with other transceivers.

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Null-modern emulator (com0com) is an open source software based on the GPLv2 license.

VB-Audio Hi-Fi Cable is the property of Mr. Vincent Burel.

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# **IC-7610 HDSDR operations**

This section gives 4 examples to control the IC-7610 from a PC using the HDSDR application.

The detailed software connections, settings, and operating instructions are described in the "IC-7610 HDSDR Operating Guide."

# A. Using the IC-7610 with HDSDR

The I/Q data output from the IC-7610's MAIN or SUB band is input to your PC. The input I/Q data can be received on HDSDR.

① The HDSDR's local oscillator frequency (LO) is synchronized with the IC-7610's operating frequency.



#### B. Using HDSDR as a 3rd receiver

The IC-7610 has the Dualwatch function. Furthermore, you can use the HDSDR application as a 3rd receiver by inputting the I/Q data that is output from the IC-7610's MAIN or SUB band. You can receive 3 different frequencies at the same time.

① The HDSDR's local oscillator frequency (LO) is synchronized with the IC-7610's operating frequency.



## C. Using HDSDR with CW Skimmer (For a narrow 24 kHz bandwidth)

The CW Skimmer application decodes the CW signals received from HDSDR. Use this way when:

- Calling a station whose CW signals are displayed on CW Skimmer.
- Calling a station that is in the Split operation and in a pile up during a DXpedition.
- Checking the CW band on CW Skimmer while communicating in the SSB mode.
- The HDSDR's local oscillator frequency (LO) and HDSDR, CW Skimmer's operating frequencies are all synchronized with the IC-7610's operating frequency.

# Install CW Skimmer (Shareware), VB-Audio Hi-Fi Cable (Donationware), and Null-modem emulator (com0com) (Freeware).



#### D. Using HDSDR with CW Skimmer (For a wide\* bandwidth)

\* Approximately 170 kHz The CW Skimmer application decodes the CW signals received from HDSDR. Use this way when checking the wide band and getting information of many CW stations. This way is useful when you participate in a CW contest.

① The HDSDR's local oscillator frequency (LO) is synchronized with the IC-7610's operating frequency.

① Manually set the same frequency to the HDSDR Tune frequency and the CW Skimmer LO frequency.

Install CW Skimmer (Shareware), VB-Audio Hi-Fi Cable (Donationware), and N1MM Logger+ (Freeware).



TIP:

Each application can be downloaded from the following websites.

- HDSDR:
- CW Skimmer:
- http://www.dxatlas.com/CwSkimmer/
- VB-Audio Hi-Fi Cable:
- https://www.vb-audio.com/Cable/index.htm#DownloadASIOBridge
- Null-modern emulator (com0com): https://sourceforge.net/projects/com0com/?source=directory
- N1MM Logger+
- https://n1mm.hamdocs.com/tiki-index.php

#### (i) Information

Icom has been checked the operations with these applications but does not guarantee their performance.

http://www.hdsdr.de/

- These applications are not Icom products.
- The URL may change without notice or obligation. Check for the latest information.

# Installing "IC-7610 USB I/Q Package for HDSDR"

# Updating the IC-7610 USB I/Q Package for HDSDR (p. 6):

If you already have the package installed, you can download the latest version and update it by doing an overwrite installation.

# ♦ Downloading

- 1. Access the Icom website. http://www.icom.co.jp/world/
- 2. Click <Support>.



3. Click "Firmware Updates/Software Downloads."



- Check the IC-7610 in Model name and click "USB I/Q Package for HDSDR (Version X.XX) and manuals."
- 5. Read "Regarding this Download Service" carefully, and then click <Agree>.



- 6. Click <Save as> in the displayed File Download dialog.
- Select the location where you want to save the file, and then click <Save> in the displayed File Download dialog.
  - The file starts downloading.

# ♦ Unzipping the firmware folder

- 1. Right-click the downloaded firmware folder (zip format).
  - The Right-click menu is displayed.
- 2. Click "Extract All ... "



- After unzipping, a folder is created in the same location as the downloaded folder.
- ① The unzipped folder contains "setup32.exe" and "setup64.exe."

# ♦ Installing

These instructions are based on Windows 10.

- 1. Double-click "setup32.exe" or "setup64.exe" contained in the unzipped folder, depending on your PC's OS type.
  - (i) Information
  - "setup32.exe" is for a 32 bit operating system. "setup64.exe" is for a 64 bit operating system.
  - You can select whether or not to display the file extensions in the Folder Options screen.
  - If "User Account Control" is displayed, click <Yes> to continue.
- Select a language and then click <OK>.
   In this document, "English" is selected.

C-7610 USB I/Q Package for HDSDR - Ir	nstallShield Wizar	× b
Select the language for the instal	lation from the cho	ices below.
<u> </u>		
English (United States)		~

#### 3. Click <Next>>.



- 4. Confirm the destination folder, and then click <Next>>.
  - ① If you change the HDSDR installed folder and install HDSDR, click <Browse...> and select the HDSDR installed folder.



5. Click <Install>.

com IC-7610 USB I/Q Package for	r HDSDR - InstallShield Wizard	×
Ready to Install the Program	1	~
The wizard is ready to begin inst	alaton	
Click Install to begin the installat	ion.	-
If you want to review or change exit the woard.	any of your installation settings, click Back. C	lick Cancel to
		-

- 6. When the Windows Security screen is displayed, click <Install>.
- 7. Click <Finish>.



**NOTE:** You can uninstall the package using the "Apps & features" in the "System" menu. To get started, click on Start > Settings > System > Apps & features.

#### NOTE: About the overwrite installation

If you already have the package installed, you can update it by following the procedure below.

③ BE SURE to turn OFF the IC-7610 and quit the HDSDR application before doing an overwrite installation.

- Double-click "setup32.exe" or "setup64.exe" contained in the unzipped folder, depending on your PC's OS type (as described in step 1 in the column to the left).
  - A confirmation dialog "This setup will perform an upgrade of 'IC-7610 USB I/Q Package for HDSDR.' Do you want to continue?" is displayed.
- 2. Click <Yes>, then follow the instructions displayed in the window.
  ① You cannot change the language or destination folder.

# Connecting the IC-7610 to a PC

Connect a USB cable (USB 3.0, User supplied) from the IC-7610's [USB 2] to one of the PC's USB ports. ① When you connect a USB cable for the first time, a PC starts installing the driver after turning ON the IC-7610.

# NOTE:

- DO NOT connect the IC-7610 to a PC through any USB hub.
- Depending on the length of a USB cable, the transceiver may not operate properly even if it is recognized by the PC. Use as short a cable as possible.



# **\diamond** Confirming that the driver has been successfully installed

After the installation has been completed, use the PC's Device Manager to confirm that the driver has been successfully installed.

# To open the Device Manager screen Windows 10

- 1. Click the folder icon on the taskbar.
- 2. Right-click "This PC," and then click "Properties."
- 3. Click "Device Manager."

## Windows 8.1

- 1. Click the folder icon on the taskbar.
- 2. Right-click "This PC," and then click "Properties."
- 3. Click "Device Manager."

## Windows 7

- 1. Click the folder icon on the taskbar.
- 2. Right-click "Computer," and then click
- "Properties."
- 3. Click "Device Manager."

# To confirm the driver

- Open the Device Manager screen.
   If "User Account Control" is displayed, click <Yes>.
- Confirm that "IC-7610 I/Q OUT Port" is displayed.
  Windows 10, 8.1, 7: Double-click "Universal Serial Bus controllers."

**NOTE:** If "IC-7610 I/Q OUT Port" is not displayed, the driver may not have been properly installed. Install the driver again.

→Installing "IC-7610 USB I/Q Package for HDSDR." (pp. 5 ~ 6)

# Using HDSDR with CW Skimmer (For a wide\* bandwidth)

\* Approximately 170 kHz When you want to use N1MM Logger+ and CW Skimmer to check the wide band, connect another USB cable (User supplied) between the IC-7610's [USB 1] and a PC's USB port.

**NOTE:** Depending on the length of a USB cable, the transceiver may not operate properly, even if it is recognized by the PC. Use as short a cable as possible.



## TIP: For the [USB 1] connection

If you have not connected a USB cable between the IC-7610 [USB 1] and your PC, download the required USB driver and the installation guide from the Icom website.

# **IC-7610 HDSDR Operating Guide**

## These instructions describe how to use the HDSDR application.

- ① Before reading this guide, read "Preparations for the IC-7610 to be used as an SDR," which can be downloaded from the Icom website, for details on how to install the software and connect the IC-7610 to HDSDR.
- ① These instructions are based on using:
  - Microsoft<sup>®</sup> Windows<sup>®</sup> 10
  - IC-7610 USB I/Q Package for HDSDR
  - HDSDR version 2.76a
  - CW Skimmer version 2.0
  - VB-Audio Hi-Fi Cable version 1.0.0.7
  - Null-modem emulator (com0com) version 3.0.0.0
  - N1MM Logger+ version 1.0.7230.0

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# Starting up HDSDR

- 1. Turn ON the IC-7610.
- 2. Double-click HDSDR icon to start up HDSDR.



① If you have installed two or more ExtIO-DLL files, the screen below is displayed. To open the HDSDR Main screen, select "ExtIO\_IC7610.dl," and then click <Open>.

🗮 Choose which Exte	ernal H	W should be used by HDSDR				×
	« Lo	al Disk (C:) > Program Files (x86) > HDSDR	~ Ö	Search HDSDR		ρ
Organise 👻 Ne	w folde	r			•	0
	^	Nama	Date modified	Tune	Siza	
📌 Quick access	l	ExtIO_IC7610.dll	177 (179) (170) (180)	Application extens	2,547	КВ
Ithis PC						
- Natural	~					
	File <u>n</u> a	me: ExtIO_IC7610.dll	v	External IO HW dri	ver (DLL) (E: Cancel	∧t ~ 

# **HDSDR Main screen**

These are parts of the HDSDR operations. Check the detailed HDSDR operations on the Internet. ① These screens are examples.



Click to start or stop operating.

Click to quit the application.

# A. Using the IC-7610 with HDSDR

# ♦ Operation

- 1. Set the HDSDR LO frequency so that it is near the frequency you want to monitor.
- Set the HDSDR Tune frequency to the frequency you want to monitor.
   The demodulated signal is output from the speaker.

**TIP:** You can hear the audio by changing only the Tune frequency without changing the LO frequency, if the frequency is within the I/Q range\*.

\* Sampling Rate range on the IC-7610 I/Q Settings screen. For example, if Sampling Rate is set to "1.92 MHz," the I/Q range is 1.66 MHz wide.



# ♦ Settings

- Click <Ext IO> to display the IC-7610 I/Q Settings screen. Set the items as described below.
   MAIN/SUB: MAIN or SUB Sync Mode: Only HDSDR sync
- 2. Click <Soundcard> to confirm that the speaker in use is selected.
- Click <Bandwidth> to set Output Sampling Rate [Hz] to "12000."
  - ① "48000" or lower is recommended. When you operate in the SSB mode, "12000" is adequate.

**TIP:** If the audio is not heard from the speaker, click <Options> and confirm that **Output Channel Mode for RX** is set to "AF to Both channels (default)."



IC-7610 I/Q Settings Ver	×
I/Q	
Sampling Rate 1.92MHz (BW =	= 1.66MHz) ~
Bit 16bit	$\sim$
MAIN/SUB MAIN	~
Sync Mode Only HDSDR sync Uruii sync in both directions Independent Tune in HDSDF	R
Transceiver	
ANT ANT1 V P.AMP	P OFF V DIGI-SEL
ATT	T OFF ~ IP+
RF Gain	
MIN	MAX
USB Dial	
TS (Tune Freq) 1k	∨ 1Hz
Settings	
	IC-7610

FreqMg

LO = 0007.01

Tune 🛛 🗖 🖉

# ♦ Action

When changing the IC-7610 operating frequency or the HDSDR LO frequency, the HDSDR Tune frequency is changed based on the LO frequency.

① The HDSDR LO is synchronized with the IC-7610's operating frequency.

① You cannot set the HDSDR LO frequency out of the IC-7610's available frequency range.

# B. Using HDSDR as a 3rd receiver

# ♦ Operation

- 1. Set the IC-7610 operating frequency.
  - The HDSDR LO frequency is linked to the IC-7610 operating frequency.
- 2. Set the HDSDR Tune frequency as a 3rd receiver frequency within the I/Q range.

# Information

- The HDSDR Tune frequency is independent and is not changed, even if you change the IC-7610 operating frequency.
- Turn ON the Dualwatch function when connecting HDSDR to the IC-7610 SUB band.
- The I/Q range\* is limited (up to 1.92 MHz wide) so you can only receive the same band as the IC-7610 operating frequency.
- \* Sampling Rate range on the IC-7610 I/Q Settings screen. For example, if Sampling Rate is set to "1.92 MHz," the I/Q range is 1.66 MHz wide.



- Click <Ext IO> to display the IC-7610 I/Q Settings screen. Set the items as described below. MAIN/SUB: MAIN or SUB
  - Sync Mode: Independent Tune in HDSDR
- 2. Click <Soundcard> to confirm that the speaker in use is selected.
- 3. Click <Bandwidth> to set Output Sampling Rate [Hz] to "12000."
  - ① "48000" or lower is recommended. When you operate in the SSB mode, "12000" is adequate.

TIP: If the audio is not heard from the speaker, click <Options> and confirm that **Output Channel Mode** for **RX** is set to "AF to Both channels (default)."



7610 I/Q Settin	gs Ver1.	00					×	
/Q								
Sampling Rate	1.92MHz	(BW = 1	.66MH	z)	$\sim$			
Bit	16bit							
MAIN/SUB	MAIN				~	]←		t:
Sync Mode							WAIN	or SUE
Only HDSD	R sync							
O Full sync in	both dired	tions						
Independe	nt Tune in	HDSDR						
Transceiver								
ANT ANT1	$\sim$	P.AMP	OFF	~	,	DIGI-S	EL	
		ATT	OFF					
		ATT	OFF	`				
RF Gain				_				
MIN				М	AX			
JSB Dial								
TS (Tune Freg)	1k		/	□ 1Hz	,			
	IN							
Settinge								

# ♦ Action

Even if you change the IC-7610 operating frequency or the HDSDR LO frequency, the HDSDR Tune frequency is not changed. Therefore, you can receive on a frequency that is different from the IC-7610.

- ① The audio output from HDSDR may be interrupted while changing the IC-7610 operating frequency.
- ① You cannot set the HDSDR LO frequency out of the IC-7610's available frequency range.

# C. Using CW Skimmer with HDSDR (For a narrow 24 kHz bandwidth)

# ♦ Operation: Making a call to a station that is decoded on CW Skimmer

- 1. Select the CW mode on the IC-7610.
- 2. Set the operating frequency to where (within ±12 kHz) a station is calling a CQ.
- 3. Click on a station decoded on CW Skimmer.
- The operating frequency is automatically set.
- 4. Transmit on the frequency and make a call to the station.
  - The IC-7610 operating frequency, the HDSDR LO frequency, the HDSDR Tune frequency, and the CW Skimmer frequency are set to the same frequency.



### Information

- You can not hear the demodulated audio from HDSDR because HDSDR in this case is used for only I/Q data conversion.
- You can hear the demodulated audio of the operating frequency from CW Skimmer which is the same audio as the IC-7610.
- The I/Q data ouput from HDSDR is input to CW Skimmer through VB-Audio Hi-Fi Cable.
- CW Skimmer uses Omni-Rig to connect to com0com and controls the HDSDR Tune frequency through the virtual serial port of com0com.

# ♦ Settings: Making a call to a station that is decoded on CW Skimmer

**NOTE:** First, setup com0com and VB-Audio Hi-Fi Cable before setting up HDSDR. The setup is required only for the first time.

## com0com



- Open the Windows Start menu and click "com0com" → "Setup."
   Setup for com0com window is displayed.
- 2. Select 2 COM port numbers that are not used. (Example: COM 10 and COM 11)
  ① DO NOT select the numbers larger than COM 20. Omni-Rig cannot support them.
  - If the COM port number is displayed in red, the number is currently used for other devices. Change the number.
- 3. Click <Apply> and close the screen.
  - If the Program Compatibility Assistant screen is displayed, click <Cancel>.



## C. Using CW Skimmer with HDSDR (For a narrow 24 kHz bandwidth)

Settings: Making a call to a station that is decoded on CW Skimmer (continued)

# **VB-Audio Hi-Fi Cable**

- 1. From the desktop, right-click your taskbar's Speaker icon and select "Recording device."
- 2. Click the "Recording" tab.
- 3. Select "Hi-Fi Cable Output" from the list and click <Properties>.



- 4. Click the "Advanced" tab.
- 5. Set "Default Format" to "2 channel, 16 bit, 192000 Hz," and then click <OK>.

Hi-Fi Cable Output Properties	×				
General Listen Levels Advanced					
Default Format Select the sample rate and bit depth to be used when running in shared mode.					
2 channel, 16 bit, 192000 Hz (Studio Quality) $\qquad \qquad \lor$					
Exclusive Mode           Image: Allow applications to take exclusive control of this device           Image: One exclusive mode applications priority					
Restore Defaults					
OK Cancel Apply					

- 6. Click the "Playback" tab.
- 7. Select "Hi-Fi Cable Input" from the list and click <Properties>.
- 8. Click the "Advanced" tab.
- 9. Set "Default Format" to "16 bit, 192000 Hz," and then click <OK>.

Settings: Making a call to a station that is decoded on CW Skimmer (continued)

### HDSDR

- 1. Set the operating mode to "USB."
- Click <Ext IO> to display the IC-7610 I/Q Settings screen. Set the items as described below. MAIN/SUB: MAIN

Sync Mode: Full sync in both directions.

AM CECSS	ESE USE 07.010.000 07.010.000	W DRM FreqMgr ExtIO
IC-7610 I/Q Setting	js Ver1.00	×
I/Q		
Sampling Rate	1.92MHz (BW = 1.66MHz)	$\sim$
Bit	16bit	$\sim$
MAIN/SUB	MAIN	$\sim$
Sync Mode Only HDSD Full sync in Independer	R svnc both directions nt Tune in HDSDR	
Transceiver		
ANT ANT1	V P.AMP OFF	UIGI-SEL
	ATT OFF	✓ IP+
RF Gain		
MIN	Ν	ИАХ
USB Dial		
TS (Tune Freq)	1H	z
-		
Ісом	IC-7610 HF/50MHz TRANSCEIVER	

 Click <Soundcard> to display the Sound Card Selection screen. Select "Hi-Fi Cable Input" to output I/Q data from HDSDR.

Peak +40	Sound Card selection	<
**************************************	Using HDSDR without audio output	1
5	0: Hi-Fi Cable Input (VB-Audio Hi-	
-1 Squelch	······································	
-139.0 dP	L L	
Soundcard [F5]		
Bandwidth [F6]	UK	

4. Click <Bandwidth> to set **Output Sampling Rate [Hz]** to "192000."  Click <Options> and set Output Channel Mode for RX to "IF as I (Left) / Q (Right)."



IQ-Gain setting is displayed on the HDSDR Main screen.

① Normally "0dB" is used but you can adjust the gain level according to your situation. (p. 21)

				IQ-Gain: +0 dB
NR	NB RF	NB IF	AFC	
Mute	AGC Med	Notch	ANotch	
				•

- 6. Click <Options> and set the items as described below.
  - Click "CAT to HDSDR"  $\rightarrow$  "Port" and select a COM port that is set in com0com.
  - Click "CAT to HDSDR" and select "activated."

Bandwidth [F6]					20000
0.11	Misc Options	•	Whats this?		
Options [F7]	Mouse Wheel	+	Port	۲	COM1
Help / Update [F	DDE to HDSDR		Baudrate (bps)	۲	CNCA0
Full Screen [F11]	CAT to Radio (Om -Rig)	) +	PTT activation pin	×	CNCB0
Stop [F2]	CAT to HDSDR		✓ activated		C 110
Minimizo (E2)	ТХ	•	-125	٦	COM11
	10/00/01 11.00.1				COM4

Settings: Making a call to a station that is decoded on CW Skimmer (continued)

# **CW Skimmer**

1. To input I/Q data to the CW Skimmer, click <View>  $\rightarrow$  <Settings>  $\rightarrow$  the "Radio" tab, and then set the items as described below. Hardware Type: SoftRock-IF Sampling Rate: 192 kHz

Settings	×
Radio Audio CAT Mi:	sc. Operator Network Calls
Hardware Type C 3-kHz Radio C SoftRock C SoftRock-IF C SDR-IQ C QS1R C Mercury C Perseus	LO Frequency, Hz CW Pitch, Hz 600 Audio IF, Hz C CU CU CU CU CU CU CU
Sampling Rate C 48 kHz C 96 kHz T 192 kHz	
	OK Cancel

2. To input the I/Q data and output the demodulated audio on the CW Skimmer to the speaker, click the "Audio" tab, and then set the items as described below.

Signal I/O Device:	Hi-Fi Cable Output
Audio I/O Device:	A speaker connected to your PC

Settings ×
Radio Audio CAT Misc. Operator Network Calls
Soundcard Driver          Signal I/O Device         01       Hi-Fi Cable Output (VB-Audio Hi         Audio I/O Device
02 Realtek Digital Output (Realtek 🔽 💌
Audio Volume Channels
Shift Right Channel Data by
C -1 sample 🕫 0 samples C +1 sample
OK Cancel

3. To control the frequency synchronization, click the "CAT" tab, and then set the items as described below.

Settings	×
Radio Audio CAT	Misc. Operator Network Calls
CAT Interface © Use Radio 1 © Use Radio 2 Configure	NONE NONE

4. Click <Congifure...> to open Omni-Rig Settings screen, and then set the items as described below.

Rig type: Port:	Kenwood Select the COM Port that is in
	com0com, and not set in HDSDR.
Poll int. ms:	100

Timeout. ms:100

③ For other settings, see the screen below.

Omni-Rig Settings X		
RIG 1 RIG 2 About		
Rig type	Kenwood	•
Port	COM 10	•
Baud rate	9600	-
Data bits	8	•
Parity	None	-
Stop bits	1	-
RTS	Low	•
DTR	Low	-
Poll int., ms	100	<b>÷</b>
Timeout, ms	100	\$
<u>(</u>	<u>)</u> K	<u>C</u> ancel

TIP: You can check the required settings on the HDSDR Main screen. <Options>  $\rightarrow$  <CAT to HDSDR>  $\rightarrow$  <What's this ?>

# Action: Making a call to a station that is decoded on CW Skimmer

Click <Start> on the HDSDR Main screen, and then click <Start> on the CW Skimmer's tool bar. • The waveform is displayed on CW Skimmer.

- The IC-7610 operating frequency, the HDSDR LO frequency, the HDSDR Tune frequency, and the CW Skimmer frequency are set to the same frequency.
- When changing the frequency, all frequencies are are synchronized. Clicking on the signal or the call sign on CW Skimmer sets the operating frequency to the IC-7610 MAIN band.
- ① Right after the frequencies are changed, the waveform on CW Skimmer may be disturbed. However, after few seconds, the waveform is correctly displayed.



# ♦ Operation: Making a call to a station that is in the Split operation and in a pile up

When a station sends "599" to a station that is in the Split operation and in a pile up, you notice the frequency the station in a pile up receives, using CW Skimmer.

- 1. Select the CW mode and on the IC-7610 MAIN band and receive the signal of a station in a pile up. (Example: 7.010 MHz)
- 2. Select the CW mode and on the IC-7610 SUB band and set the operating frequency near the receive frequency of the station in a pile up. (Example: 7.015 MHz)
- 3. Turn ON the Split function on the IC-7610.
- 4. Turn ON the Dualwatch function on the IC-7610 and start HDSDR and CW Skimmer.
  The I/Q data is input from the IC-7610 SUB band to HDSDR.
- 5. Click on the displayed signal that may be used by the station in a pile up on CW Skimmer.
  - The frequency is set to the IC-7610 SUB band.
  - The IC-7610 SUB band operating frequency, the HDSDR LO frequency, the HDSDR Tune frequency, and the CW Skimmer frequency are set to the same frequency.
- 6. Transmit to the station on the IC-7610 SUB band.
  ① Your signal is transmitted on the SUB band.



#### Information

- You can not hear the demodulated audio from HDSDR because HDSDR in this case is used for only I/Q data conversion.
- You can hear the demodulated audio of the operating frequency from CW Skimmer which is the same audio as the IC-7610.
- The I/Q data ouput from HDSDR is input to CW Skimmer through VB-Audio Hi-Fi Cable.
- CW Skimmer uses Omni-Rig to connect to com0com and controls the HDSDR Tune frequency through the virtual serial port of com0com.

# ♦ Settings: Making a call to a station that is in the Split operation and in a pile up

**NOTE:** First, setup com0com and VB-Audio Hi-Fi Cable before setting up HDSDR. The setup is required only for the first time.

## com0com

**TIP:** If the COM port numbers are between COM 1 and COM 20 as the default, you do not have to follow the steps below.

- Open the Windows Start menu and click "com0com" → "Setup."
- Setup for com0com window is displayed.
- 2. Select 2 COM port numbers that are not used. (Example: COM 10 and COM 11)
  - ① DO NOT select the numbers larger than COM 20. Omni-Rig cannot support them.
  - ① If the COM port number is displayed in red, the number is currently used for other devices. Change the number.
- Click <Apply> and close the screen..
  If the Program Compatibility Assistant screen is displayed, click <Cancel>.

# VB-Audio Hi-Fi Cable

- 1. From the desktop, right-click your taskbar's Speaker icon and select "Recording device."
- 2. Click the "Recording" tab.
- 3. Select "Hi-Fi Cable Output" from the list and click <Properties>.



4. Click the "Advanced" tab.



5. Set "Default Format" to "2 channel, 16 bit, 192000 Hz," and then click <OK>.



- 6. Click the "Playback" tab.
- 7. Select "Hi-Fi Cable Input" from the list and click <Properties>.
- 8. Click the "Advanced" tab.
- 9. Set "Default Format" to "16 bit, 192000 Hz," and then click <OK>.

## C. Using CW Skimmer with HDSDR (For a narrow 24 kHz bandwidth)

Settings: Making a call to a station that is in the Split operation and in a pile up (continued)

## HDSDR

- 1. Set the operating mode to "USB."
- Click <Ext IO> to display the IC-7610 I/Q Settings screen. Set the items as described below. MAIN/SUB: SUB

Sync Mode: Full sync in both directions.



 Click <Soundcard> to display the Sound Card Selection screen. Select "Hi-Fi Cable Input" to output I/Q data from HDSDR.

Peak +40	Sound Card selection	<
**************************************	Using HDSDR without audio output	1
5	0: Hi-Fi Cable Input (VB-Audio Hi-	
-1 Squelch	······································	
-139.0 dP	L L	
Soundcard [F5]		
Bandwidth [F6]	UK	

4. Click <Bandwidth> to set **Output Sampling Rate [Hz]** to "192000."  Click <Options> and set Output Channel Mode for RX to "IF as I (Left) / Q (Right)."



IQ-Gain setting is displayed on the HDSDR Main screen.

① Normally "0dB" is used but you can adjust the gain level according to your situation. (p. 21)

				IQ-Gain: +0 dB
NR	NB RF	NB IF	AFC	
Mute	AGC Med	Notch	ANotch	
				ł

- Click <Options> and set the items as described below.
  - Click "CAT to HDSDR"  $\rightarrow$  "Port" and select a COM port that is set in com0com.
  - Click "CAT to HDSDR" and select "activated."

Bandwidth [F6]					20000
0.11	Misc Options	•	Whats this?		
Options [F7]	Mouse Wheel	+	Port	۲	COM1
Help / Update [F	DDE to HDSDR		Baudrate (bps)	۲	CNCA0
Full Screen [F11]	CAT to Radio (Om -Rig)	) +	PTT activation pin	×	CNCB0
Stop [F2]	CAT to HDSDR		✓ activated		C 110
Minimizo (E2)	ТХ	•	-125	٦	COM11
	10/00/01 11.00.1				COM4

## C. Using CW Skimmer with HDSDR (For a narrow 24 kHz bandwidth)

Settings: Making a call to a station that is in the Split operation and in a pile up (continued)

## **CW Skimmer**

1. To input I/Q data to the CW Skimmer, click <View>  $\rightarrow$  <Settings>  $\rightarrow$  the "Radio" tab, and then set the items as described below. Hardware Type: SoftRock-IF Sampling Rate: 192 kHz

Settings	×
Radio Audio CAT M	isc. Operator Network Calls
Hardware Type C 3-kHz Radio C SoftRock SoftRock-IF C SDR-IQ C QS1R C Mercury C Perseus	LO Frequency, Hz CW Pitch, Hz 600
Sampling Rate C 48 kHz C 96 kHz F 192 kHz	
	OK Cancel

2. To input the I/Q data and output the demodulated audio on the CW Skimmer to the speaker, click the "Audio" tab, and then set the items as described below.

Signal I/O Device:	Hi-Fi Cable Output
Audio I/O Device:	A speaker connected to your PC

Settings ×
Radio Audio CAT Misc. Operator Network Calls
Soundcard Driver MME C WDM Signal I/O Device 01 Hi-Fi Cable Output (VB-Audio Hi
02 Realtek Digital Output (Realtek 🗾 💌
Audio Volume     Channels       Channels     Chett/Right = 1 / Q       Chett/Right = Q / I
Shift Right Channel Data by
C -1 sample © 0 samples C +1 sample
OK Cancel

3. To control the frequency synchronization, click the "CAT" tab, and then set the items as described below.

CAT Interface:	Use	Radio	1
----------------	-----	-------	---

Settings	×
Radio Audio CAT	Misc. Operator Network Calls
CAT Interface © Use Radio 1 © Use Radio 2 Configure	NONE NONE
Configure	
	OK Cancel

4. Click <Congifure...> to open the Omni-Rig Settings screen, and then set the items as described below. Ri

g type: Kenwood	
-----------------	--

Port: Select the COM Port that is in com0com, and not set in HDSDR.

Poll	int.	ms:	100
Time	eout	. ms:	100

For other settings, see the screen below.

Omni-Rig Settings 🛛 🗙 🗙		
RIG 1 RIG 2	About	
Rig type	Kenwood	•
Port	COM 10	-
Baud rate	9600	-
Data bits	8	-
Parity	None	-
Stop bits	1	-
RTS	Low	-
DTR	Low	-
Poll int., ms	100	\$
Timeout, ms	100	ŧ
<u>[</u>	<u>i</u> k	Cancel

TIP: You can check the required settings on the HDSDR Main screen. <Options>  $\rightarrow$  <CAT to HDSDR>  $\rightarrow$  <What's this ?>

# ♦ Action: Making a call to a station that is in the Split operation and in a pile up

Click <Start> on the HDSDR Main screen, and then click <Start> on the CW Skimmer's tool bar. • The waveform is displayed on CW Skimmer.

- The IC-7610 SUB band operating frequency, the HDSDR LO frequency, the HDSDR Tune frequency, and the CW Skimmer frequency are set to the same frequency.
- When changing the frequency, all frequencies are synchronized. Clicking on the signal or the call sign on CW Skimmer sets the operating frequency to the IC-7610 SUB band.
- ① Right after the frequencies are changed, the waveform on CW Skimmer may be disturbed. However, after few seconds, the waveform is correctly displayed.



# Operation: Checking the CW band on CW Skimmer while communicating in the SSB mode

While communicating in the SSB mode, when a signal of the CW station you want to make a call to is decoded on CW Skimmer, turn ON the Split function on the IC-7610 to make a call. ① You can also use the same band and the same operating mode Dualwach.

- Select the SSB mode and set the receive frequency (14.200 MHz) on the IC-7610 MAIN band.
   ① Communicate in the SSB mode until a target station appears.
- 2. Select the CW mode and set the transmit frequency (7.015 MHz) on the IC-7610 SUB band.
- 3. Turn ON the Dualwatch function on the IC-7610 and start HDSDR and CW Skimmer.
- The I/Q data is input from the IC-7610 SUB band to HDSDR.
- 4. If a CW station you want to make a call is displayed on CW Skimmer, click the displayed signal.
  - The frequency is set to the IC-7610 SUB band.
  - The IC-7610 SUB band operating frequency, the HDSDR LO frequency, the HDSDR Tune frequency, and the CW Skimmer frequency are set to the same frequency.
- 5. Turn ON the Split function on the IC-7610 and transmit to the station on the IC-7610 SUB band.



#### Information

- You can not hear the demodulated audio from HDSDR because HDSDR in this case is used for only I/Q data conversion.
- You can hear the demodulated audio of the operating frequency from CW Skimmer which is the same audio as the IC-7610.
- The I/Q data ouput from HDSDR is input to CW Skimmer through VB-Audio Hi-Fi Cable.
- CW Skimmer uses Omni-Rig to connect to com0com and controls the HDSDR Tune frequency through the virtual serial port of com0com.

# Settings: Checking the CW band on CW Skimmer while communicating in the SSB mode

**NOTE:** First, setup com0com and VB-Audio Hi-Fi Cable before setting up HDSDR. The setup is required only for the first time.

# com0com

**TIP:** If the COM port numbers are between COM 1 and COM 20 as the default, you do not have to follow the steps below.

- Open the Windows Start menu and click "com0com" → "Setup."
   Setup for com0com window is displayed.
- 2. Select 2 COM port numbers that are not used. (Example: COM 10 and COM 11)
  ① DO NOT select the numbers larger than COM 20. Omni-Rig cannot support them.
  - If the COM port number is displayed in red, the number is currently used for other devices. Change the number.
- Click <Apply> and close the screen..
  (i) If the Program Compatibility Assistant screen is displayed, click <Cancel>.

# VB-Audio Hi-Fi Cable

- 1. From the desktop, right-click your taskbar's Speaker icon and select "Recording device."
- 2. Click the "Recording" tab.
- 3. Select "Hi-Fi Cable Output" from the list and click <Properties>.



4. Click the "Advanced" tab.

Virtual Port Pair 0     OM10     COM10     COM10     Omto Port Pair 1     Onto Port Pai	Setup for com0com		-		×
ON	Virtual Port Pair 0     GrCA0     GrCNCB0     Virtual Port Pair 1     GrCOM10     GrCOM10     GrCOM11	COM10 use Porte class emulate baud rate enable buffer overnun enable plug+n mode enable exclusive mode enable hidden mode RX • DTR • DSR • DCD • RTS • CTS • CTS • RTS • OUT • OUT • OUT • OPEN •	emulate enable enable enable	ts class buffer of plug-in hidden	COM11 rate overrun mode ve mode mode RX DTR DSR DTR DSR CTS RI OUT1 OUT1 OUT2 OPEN

5. Set "Default Format" to "2 channel, 16 bit, 192000 Hz," and then click <OK>.



- 6. Click the "Playback" tab.
- 7. Select "Hi-Fi Cable Input" from the list and click <Properties>.
- 8. Click the "Advanced" tab.
- 9. Set "Default Format" to "16 bit, 192000 Hz," and then click <OK>.

Settings: Checking the CW band on CW Skimmer while communicating in the SSB mode (continued)

## HDSDR

- 1. Set the operating mode to "USB."
- Click <Ext IO> to display the IC-7610 I/Q Settings screen. Set the items as described below. MAIN/SUB: SUB

Sync Mode: Full sync in both directions.

	FM 🕥 LSB 🚺 USB	
	)7.015 <mark>.00</mark>	FreqMgr
Tune <b>000</b>	7.015.00	ExtIO
IC-7610 I/Q Setting	gs Ver1.00	>
I/Q		
Sampling Rate	1.92MHz (BW = 1.66MHz)	$\sim$
Bit	16bit	$\sim$
MAIN/SUB	SUB	~
Sync Mode Only HDSDI Full sync in Independer	R svnc both directions nt Tune in HDSDR	
	P AMP OFF	
001 0011		
RF Gain		MAX
USB Dial		
TS (Tune Freq) Settings		1Hz
~		
Ісом	IC-76 HF/50MHz TRANSCEIV	

 Click <Soundcard> to display the Sound Card Selection screen. Select "Hi-Fi Cable Input" to output I/Q data from HDSDR.

Peak +40	Sound Card selection	<
**************************************	Using HDSDR without audio output	1
5	0: Hi-Fi Cable Input (VB-Audio Hi-	
-1 Squelch	······································	
-139.0 dP	L L	
Soundcard [F5]		
Bandwidth [F6]	UK	

4. Click <Bandwidth> to set **Output Sampling Rate [Hz]** to "192000."  Click <Options> and set Output Channel Mode for RX to "IF as I (Left) / Q (Right)."



IQ-Gain setting is displayed on the HDSDR Main screen.

① Normally "0dB" is used but you can adjust the gain level according to your situation. (p. 21)

				IQ-Gain: +0 dB
	NB RF	NB IF	AFC	
Mute	AGC Med	Notch	ANotch	

- Click <Options> and set the items as described below.
  - Click "CAT to HDSDR"  $\rightarrow$  "Port" and select the COM port that is set in com0com.
  - Click "CAT to HDSDR" and select "activated."

Bandwidth [F6]					20000 2
Optiona (F71	Misc Options	_	Whats this?	_	
Options [F7]	Mouse Wheel		Port	×	COM1
Help / Update [F	DDE to HDSDR		Baudrate (bps)	۲	CNCA0
Full Screen [F11]	CAT to Radio (Oma-Rig) >		PTT activation pin	×	CNCB0
Stop [F2]	CAT to HDSDR	$\checkmark$	activated		C2(110
Minimize [E3]	TX +		-125		© COM11
ZU.					COM4

## C. Using CW Skimmer with HDSDR (For a narrow 24 kHz bandwidth)

Settings: Checking the CW band on CW Skimmer while communicating in the SSB mode (continued)

## **CW Skimmer**

To input I/Q data to the CW Skimmer, click
 <View> → <Settings> → the "Radio" tab, and then
 set the items as described below.
 Hardware Type: SoftRock-IF
 Sampling Rate: 192 kHz

Settings	×
Radio Audio CAT Mi	sc. Operator Network Calls
Hardware Type C 3-kHz Radio C SoftRock SoftRock-IF C SDR-IQ C QS1R C Mercury C Perseus	L0 Frequency, Hz 0 CW Pitch, Hz 600 Audio IF, Hz 0 C
Sampling Rate C 48 kHz C 96 kHz C 192 kHz	
	OK Cancel

2. To input the I/Q data and output the demodulated audio on the CW Skimmer to the speaker, click the "Audio" tab, and then set the items as described below.

Signal I/O Device:	Hi-Fi Cable Output
Audio I/O Device:	A speaker connected to your PC

Settings ×			
Radio Audio CAT   Misc.   Operator   Network   Calls			
Soundcard Driver MME C WDM Signal I/O Device 01 Hi-Fi Cable Output (VB-Audio Hi			
02 Realtek Digital Output (Realtek 🗨			
Audio Volume Channels Channels CLeft/Right = I / Q CLeft/Right = Q / I			
- Shift Bight Channel Data bu			
C -1 sample © 0 samples C +1 sample			
OK Cancel			

 To control the frequency synchronization, click the "CAT" tab, and then set the item as described below.
 CAT Interface: Use Radio 1

Settings		×
Radio Audio CAT	Misc. Operator N	etwork Calls
CAT Interface		
Use Radio 1	NONE	
O Use Badio 2	NONE	
Configure		
	OK	Cancel

- Click <Congifure...> to open Omni-Rig Settings screen, and then set the items as described below.
  - Rig type: Kenwood
  - Port:

Select a COM Port that is in

# com0com and not set in HDSDR. **Poll int. ms:** 100

## Timeout. ms:100

③ For other settings, see the screen below.

Omni-Rig Settings X			
RIG 1 RIG 2 About			
Rig type	Kenwood 💌		
Port	СОМ 10 🖃		
Baud rate	9600 💌		
Data bits	8 🔹		
Parity	None		
Stop bits	1 💌		
RTS	Low		
DTR	Low		
Poll int., ms	100 🚖		
Timeout, ms	100		
<u> </u>			

**TIP:** You can check the required settings on the HDSDR Main screen. <Options>  $\rightarrow$  <CAT to HDSDR>  $\rightarrow$  <What's this ?>

# ♦ Action: Checking the CW band on CW Skimmer while communicating in the SSB mode

Click <Start> on the HDSDR Main screen, and then click <Start> on the CW Skimmer's tool bar. • The waveform is displayed on CW Skimmer.

- The IC-7610 SUB band operating frequency, the HDSDR LO frequency, the HDSDR Tune frequency, and the CW Skimmer
- frequency are set to the same frequency. ① When changing the frequency, all frequencies are synchronized. Clicking on the signal or the call sign on CW Skimmer sets the operating frequency to the IC-7610 SUB band.
- ① Right after the frequencies are changed, the waveform on CW Skimmer may be disturbed. However, after few seconds, the waveform is correctly displayed.

#### CW Skimmer 2.0 × File View Commands 🖬 | 📼 | 👫 | 💶 | 🔚 | 🚥 | 🗔 | 🖬 🎫 创 7015.00 LO A FreqMgr All Tune 🛙 ExtI0 synchronized /olume AGC Thresh S9 +8 dB Soundcard [F5] Bandwidth [F6] Options [F7] IQ-Gain: +0 dB Help / Update [F1] Full Screen [F11] GC Med [F2] Minimize [F3] 2018/ 11:01:09 CPU HDSDR: IF4 IC-7610 AN1 P.AMP ATT OFF VFO FIL2 IP+ 200 OFF 5k/10dB +25k ECTRUM SCOPI AGC -25k MID vox OFF COMP OFF W TCD ES > FQ DX DE K Image: Imag -15 -10 ò +5 +10 +15 -5

# **CW Skimmer**

HDSDR

# ♦ Troubleshooting

If the straight line as shown to the right is displayed on CW Skimmer, adjust the IQ-Gain setting on HDSDR. The straight line is displayed because of a sharp spike (a DC), if the noise floor is too low.

The IQ-Gain setting is displayed by <Options> and set Output Channel Mode for RX to

"IF as I (Left) / Q (Right)." (pp. 8, 13, 18, 24)





#### TIP: When adjusting the IQ-Gain setting

- The IQ-Gain should not be too high. After the straight line is disappeared, do not set the gain higher than that level.
  If the IQ-Gain is too high, CW Skimmer becomes easily saturated when receiving a strong signal. If CW Skimmer is
- saturated, lower the IQ-Gain or lower the input level on the IC-7610.
- Turn OFF the Preamplifier.
- Turn ON the Attenuator function.
- Lower the RF gain.
- Turn ON the Digital Selector function.

# D. Using CW Skimmer with HDSDR (For a wide\* bandwidth)

# ♦ Operation

\* Approximately 170 kHz

1. Select the CW mode on the IC-7610 MAIN band and set the operating frequency of the CW band you want to decode.

① The station information decoded on CW Skimmer through HDSDR is input to N1MM Logger+.

- 2. Click the displayed station on N1MM Logger+.
- The frequency is set to the IC-7610 MAIN band.
- 3. Transmit to the station.



# Information

- You can not hear the demodulated audio from HDSDR because HDSDR in this case is used for only I/Q data conversion.
- You can hear the demodulated audio of the operating frequency from CW Skimmer, regardless of IC-7610 operating frequency.
- The I/Q data output from HDSDR is input to CW Skimmer through VB-Audio Hi-Fi Cable.
- The decoded result is output to N1MM Logger+ through Telnet.
- · Connects the USB cable to the PC. N1MM Logger+ remotely controls the IC-7610 by the CI-V commands.

# When you want to connect the IC-7610 SUB band to HDSDR, turn ON the Dualwatch function and select the SUB band on IC-7610 I/Q Settings screen on HDSDR.



\*2 Manually set both the HDSDR Tune frequency and the CW Skimmer LO frequency to the same frequency.

### D. Using CW Skimmer with HDSDR (For a wide bandwidth)

# ♦ Settings

NOTE: First, setup VB-Audio Hi-Fi Cable before setting up HDSDR. The setup is required only for the first time.

## VB-Audio Hi-Fi Cable

- 1. From the desktop, right-click your taskbar's Speaker icon and select "Recording device."
- 2. Click the "Recording" tab.
- 3. Select "Hi-Fi Cable Output" from the list and click <Properties>.



4. Click the "Advanced" tab.

5. Set "Default Format" to "2 channel, 16 bit, 192000 Hz," and then click <OK>.



- 6. Click the "Playback" tab.
- 7. Select "Hi-Fi Cable Input" from the list and click <Properties>.
- 8. Click the "Advanced" tab.
- 9. Set "Default Format" to "16 bit, 192000 Hz," and then click <OK>.

#### HDSDR

- 1. Set the operating mode to "USB."
- Click <Ext IO> to display the IC-7610 I/Q Settings screen. Set the items as described below.
   MAIN/SUB: MAIN or SUB
   Sync Mode: Independent Tune in HDSDR

AM C ECSS LO A OOC Tune OOC	FM         LSB         USB         JW         DRM           07.006.000         FreqMgr           07.085.000         Extto	
IC-7610 I/Q Setting	gs Ver1.00	×
I/Q		
Sampling Rate	1.92MHz (BW = 1.66MHz) ~	
Bit	16bit $\checkmark$	
MAIN/SUB	MAIN ~	
Sync Mode Only HDSD Full sync in Independe	R sync both directions nt Tune in HDSDR	
ANT ANT1	P.AMP OFF      DIGI-SE	L
	ATT OFF V IP+	
RF Gain		
MIN	MAX	
USB Dial TS (Tune Freq) Settings	[ <u>ik</u> ] → □ 1Hz	
ICOM	IC-7610 HF/50MHz TRANSCEIVER	0.0.0

 Click <Soundcard> to display the Sound Card Selection screen. Select "Hi-Fi Cable Input" to output I/Q data from HDSDR.

Peak +40	Sound Card selection	×
+20 7 3 5-units 1 5quetch -139.0 dP	Using HDSDR without audio output	
Soundcard [F5]	OK	

4. Click <Bandwidth> to set **Output Sampling Rate [Hz]** to "192000."  Click <Options> and set Output Channel Mode for RX to "IF as I (Left) / Q (Right)."



IQ-Gain setting is displayed on the HDSDR Main screen.

① Normally "0dB" is used but you can adjust the gain level according to your situation. (p. 21)



6. Set the HDSDR Tune frequency to the center of the frequency range you want to decode.
① For example, if you want to decode the frequency range 7.000 MHz ~ 7.170 MHz, set the center frequency to 7.085 MHz.

LOA 0007.006.000	FreqMgr
Tune 0007.085.000	ExtIO

#### **CW Skimmer**

To input I/Q data to the CW Skimmer, click
 <View> → <Settings> → the "Radio" tab, and then
 set the items as described below.
 Hardware Type: SoftRock
 Sampling Rate: 192 kHz
 LO Frequency, Hz: The same frequency as the
 HDSDR Tune frequency.

Settings	×
Radio Audio Misc. Opera	tor Network Calls
Hardware Type C 3-kHz Radio SoftRock C SoftRock-IF C SDR-IQ C QS1R C Mercury C Perseus	LO Frequency, Hz 7085000
Sampling Rate C 48 kHz C 96 kHz F 192 kHz	
	OK Cancel

 To input the I/Q data and output the demodulated audio on the CW Skimmer to the speaker, click the "Audio" tab, and then set the items as described below.
 Signal I/O Device: Hi-Fi Cable Output

Audio I/O Device: A speaker connected to your PC

Settings ×			
Radio Audio CAT   Misc.   Operator   Network   Calls			
Soundcard Driver			
Signal I/O Device			
01 Hi-Fi Cable Output (VB-Audio Hi 📃 💌			
Audio I/O Device			
02 Realtek Digital Output (Realtek			
02 Realtek Digital Dutput (Realtek         Audio Volume         Channels         Channels         Left/Right = 1 / Q         Left/Right = Q / I         Shift Right Channel Data by         C -1 sample       © 0 samples       C +1 sample			
OK Cancel			

 To output the decoded result to N1MM Logger+, click the <Network> tab, and then set the items as described below.

Enable Telnet Server: Put a check mark. Port: Default setting (7300) is recommended.

Settings	×		
Radio Audio Misc.	Operator Network Calls		
I Enable Telnet Server Port:  7300 ♀			
Require Password			
Password:			
Do not send callsigns without "CQ"			
Allow SKIMMER commands			
🔲 Only to/from this User:			
	,		
🔲 Send Spectrum via UDP			
Source Name	CW Skimmer		
Destination Address	127.0.0.1		
Destination Port	13064 🗢		
-	OK Cancel		

- 4. Click <OK>.
  - ① If a fire wall setting confirmation screen is displayed, allow access.

## N1MM Logger+

- Click <Config> → <Configure Ports, Mode Control, Audio, Other...> to open the Configurer screen.
- Click the "Harware" tab, and then set the items as described below.
   Port: Select a COM port number used for the IC-7610 CI-V communication
   Radio: IC-7610
- Click <Set> to display the COM port number screen, and then set the items described below.
   Speed: CI-V Baud Rate set on the IC-7610
   (i) For other settings, see the screen below.

K Configurer				
Hardware Function Key	rs Digital Modes Other	Winkey Mode Control	Antennas Score Reporting	Broadcast Data Audio
Port         Rad           COM1         C-77           None         Non           LPT1         LPT2           LPT3         Non	3io 3ig C 6610 √ 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	WOher Detais Set Set Set Set DTR (pn 4) Always Off ~ Always Off ~ Always Off ~	SOIV     4800,N,8,2,DTR-Ahvay     4800,N,8,2,DTR-Ahvay     Try     Bartable     RTS (pin 7)	SO2V SO2R s On,RTS-Always On,Tx s Stop Bits is (hex): Radio Nr is (hex): Radio Nr is (hex): Radio Nr is Software PTT mmand SSB Mode mmand CW Mode mmand Digital Mode
	ок	Can	C	OK Cancel

- 4. Click <Tools>  $\rightarrow$  <Telnet Window Tools> to open the Telnet screen.
- Click "Filter" tab and then set the items as described below.
   Randomize incoming Spot Frequencies: Remove the check mark.

Ma Telnet —	]	×
Type: Reconnect		•
localport Clusters Bands/Mode Filters pot Comment BandPlans		
Bandmap DX spot timeout (min)     60     Save Spots     Update       Image: Spots state     GSYing wipes call and puts it in the bandmap     Tip: Filter as many spots as you can at the cluster. It lowers the cluster is lowers the cluster. It lowers the cluster		
Blacklisted Spots		۷

6. Click "Clusters" tab and then set the item as described below.

Selected Cluster: localport

7. Click <Connect to local port>.

🖞 Telnet	—	×
ype:	Reconnect	Ē
ocalport Clusters Bands/Modes Filters Spo	ot Comment BandPlans	-
Salacted Cluster		
localport	✓ Edit List	
Automatically Logon	Logon with	
Format for DXSpider Cluster	Show Telnet Buttons	
Connect to localport	3 🖨 Cluster Keep Alive Interval (minutes)	

8. Enter your call sign into Type, and then push [Enter] on your PC's keyboard.

🞇 Telnet							-		×
Type:						Reconn	ect		
localport Clusters	Bands/Modes Fi	Iters   Spot Commer	t  Ban	dPlar	ns				
Connecting to: Welcome to the CW Skimmer 2.0 Please enter y JA3YUA JA3YUA de SKIM DX de -#: DX de -#: DX de -#: DX de -#:	127.0.0.1:730 CW Skimmer Te is operated b our callsign: MER 2018-08-07 7065.1 7018.0 7169.0 7051.4	10> 127.0.0. Inet cluster p yy, in () 10:00Z CwSkim 1 2 1 2	1:730 ort! 3 dB 2 dB 8 dB 0 dB	16 19 21 22	WPM WPM WPM WPM	DE		1000Z 1000Z 1000Z 1000Z	
BYE	<u>C</u> ONN	DVN		<u>s</u> h/d)	ĸ	USER	s	<u>w</u> wv	
Clear NE	Yes DX	NE only		No D)	(	No VI	IF	JA3YU	A

# ♦ Action

The approximately 170 kHz wide frequency range from the center frequency (the HDSDR Tune frequency) is decoded on CW Skimmer, and the decoded result is displayed on N1MM Logger+. Click the displayed station on N1MM Logger+ to set the frequency to the IC-7610.

- ① Even if you change the IC-7610 operating frequency or the HDSDR LO frequency, the HDSDR Tune frequency is not changed.
- ① The CW Skimmer frequencies do not affect the operation.

#### HDSDR



#### **CW Skimmer**

\_

No Score

Reconnect Scrolling Paused

No VHF

Comment

Snt Rcv Name

<sup>12</sup> Call history UserText appears

7020.3 7094.8 7021.7 7013.0 7006.0 7012.1 7017.0 7012.1

NE only

No DX

....

Yes DX

# New #

.... New # ¤ New # ##

×

×

 9
 dB
 32
 W

 17
 dB
 21
 W

 22
 dB
 20
 W

 29
 dB
 22
 W

 28
 dB
 16
 W

 41
 dB
 24
 W

 14
 dB
 26
 W

 47
 dB
 28
 W



#### N1MM Logger+

80



# **HDSDR** setting notes

# ♦ Tune fixed to 'LO <-> Tune Offset'

To eliminate a setting contention, click <Options>  $\rightarrow$  <Misc Options> and remove the check mark from

Tune fixed to 'LO <-> Tune Offset.'

This setting competes with the setting on the IC-7610 I/Q Setting screen.

① If you want to put a check mark in Tune fixed to 'LO <-> Tune Offset,' set Sync Mode to "Only HDSDR sync" on the IC-7610 I/Q Setting screen.



# ♦ The Lock function

The Lock function also competes with the setting on the IC-7610 I/Q Setting screen. The HDSDR Lock function is not usable.

- When you click on "LO" or "Tune" next to the frequency, "Locked" is displayed. When the HDSDR Lock function correctly works, the frequency cannot be changed.
- ① If you want to use this setting, set Sync Mode to "Only HDSDR sync" on the IC-7610 I/Q Setting screen.

# IC-7610 I/Q Settings screen

## This screen is displayed by clicking "Ext IO" on the HDSDR Main screen.

IC-7610 I/Q Settings Ver1.00 ×			
I/Q			
<ol> <li>Sampling Rate</li> </ol>	1.92MHz (BW = 1.66MHz) ~		
2 Bit	16bit $\sim$		
3 MAIN/SUB	MAIN $\sim$		
4 Sync Mode			
Only HDSD	R sync		
O Full sync in	both directions		
() Independe	nt Tune in HDSDR		
Transceiver	6		
5 ANT ANT1	V P.AMP OFF V 8 DIGI-SEL		
10 RF Gain	OVF		
MIN	МАХ		
USB Dial			
12 TS (Tune Freq)	1Hz		
3 Settings			
0	IC-7610		
ICOM	HF/50MHz TRANSCEIVER		

# Sampling Rate

(Default: 1.92 MHz (BW = 1.66 MHz)) Select the sampling rate of the signal that is input to a HDSDR.

- ① The frequency range changes, depending on the set sampling rate.
- ① If the audio is interrupted, select a lower sampling rate.

## 2 Bit

(Default: 16 bit) Select the bit depth of the signal that is input to the HDSDR.

(1) When Sampling Rate (1) is set to

"1.92 MHz (BW = 1.66 MHz)," Bit is set to "16bit."

#### **3 MAIN/SUB** (Default: MAIN) Select the IC-7610 MAIN band or SUB band to input the I/Q signal to HDSDR.

① When selecting "SUB," the Dualwatch function on the IC-7610 is automatically turned ON.

# 4 Sync Mode

(Default: Only HDSDR sync) Select whether or not the HDSDR Tune frequency is syncronized with the IC-7610.

Only HDSDR sync:

Select this option when "A. Using the IC-7610 as an SDR." When changing the IC-7610 operating frequency or the HDSDR LO frequency, the HDSDR Tune frequency is changed based on the LO frequency.

· Full sync in both directions: Select this option when "C. Using CW Skimmer with HDSDR (For a narrow 24 kHz bandwidth)." The IC-7610 operating frequency, the HDSDR LO frequency, the HDSDR Tune frequency, and the CW Skimmer frequency are syncronized.

• Independent Tune in HDSDR:

Select this option when "B. Using HDSDR as a 3rd receiver" or "D. Using CW Skimmer with HDSDR (For a wide bandwidth)." Even if you change the IC-7610 operating frequency or the HDSDR LO frequency, the HDSDR Tune frequency is not changed.

# 5 ANT

Select antenna connector ANT 1, ANT 2, ANT 1/R, or ANT 2/R.

(i) If RX-ANT Connectors on the IC-7610 is set to "RX-I/O," you cannot select "ANT 1/R" or "ANT 2/R."

# 6 P.AMP

Turn the Preamplifier function ON or OFF.

## 🕜 ATT

Select the Attenuator setting.

# 8 DIGI-SEL

Turn the DIGI-SEL function ON or OFF.

# 9 IP+

Turn the IP Plus function ON or OFF.

## 🔟 RF Gain

Adjust the RF gain (sensitivity).

# 

Displayed when receiving an excessively strong signal. If it is displayed, decrease the input level from the IC-7610.

## 1 TS (Tune Freq), 1 Hz

(Default: 1k (except for the FM mode), 25k (FM mode))

Select the tuning steps when you set the Tune frequency using the RC-28 REMOTE ENCODER (When the TS function on the RC-28 is ON).

#### (i) Information

- When the TS function is OFF, the tuning step is set to 10 Hz.
- When putting a check mark in 1 Hz, the tuning step is changed to 1 Hz.
- When rotating RC-28's [Main dial] to set the LO frequency, the tuning step depends on Sampling Rate (1).

Funing steps when yo	u set the LO frequen	cy using the RC-28
	2	

Sampling Rate	TS is ON	TS is OFF
1.92 MHz	1 MHz	100 kHz
960 kHz		
480 kHz	100 kHz	10 kHz
240 kHz		
120 kHz		
60 kHz	10 kHz	4 141-
30 kHz		

## IS <Settings...>

Click to display the USB Dial Settings screen. (p. 30)

# **USB Dial Settings screen**

This screen is displayed by clicking <Settings...> on the IC-7610 I/Q Settings screen.

USB Dial Settings		×
1 Select Device		
RC-28		~
2 Dial Sensitivity		
Low		High
3 Auto TS		
OFF	ON ( Low )	• ON ( High )
Firmware Version		4 ок

# Select Device

Select the RC-28 to operate the IC-7610 through the HDSDR software.

① The RC-28 whose [LINK] indicator lights green is automatically selected.

# 2 Dial Sensitivity

(Default: 3)

Set the dial sensitivity to one of 5 levels. When a low level is set, the dial speed is reduced for finer tuning control.

When a high level is set, the dial speed increases.

**3 Auto TS** (Default: ON (High)) When you rapidly rotate the dial, the tuning speed accelerates, depending on this setting.

- OFF: Normal tuning steps, even during a rapid rotation.
- ON (Low): The tuning speeed is approximately 2 times faster.
- ON (High): When the tuning step is set to 1 kHz or smaller steps, the tuning speed is approximately 5 times faster. When the tuning step is set to larger than 1 kHz, the tuning speed is approximately 2 times faster.

# 4 <0K>

Click to save the settings and close the screen.

# Using the RC-28

If you connect the optional RC-28 REMOTE ENCODER to the PC, you can use HDSDR and feel like you are operating the actual IC-7610's main dial.

1. Connect the RC-28 to a PC that has HDSDR installed.

**NOTE: DO NOT** connect the RC-28 to the PC with other than the supplied USB cable, or through any USB hub. Otherwise the RC-28 may not work properly.

① When you connect the RC-28 to the PC for the first time, wait until "Device driver software installed successfully." is displayed.



- 2. Start up HDSDR.
  - The [LINK] indicator on the RC-28 lights green.



• [LINK] indicator

• Now you can control the assigned functions of HDSDR using the RC-28.

**TIP:** If the [LINK] indicator does not light, confirm **Select Device** on the USB Dial Settings screen is set to the RC-28's serial number. (Example: RC-28 02XXXX)



# Main dial

[F-2]

Rotate to change the frequency. ① Changes according to **Sync Mode** on the IC-7610 I/Q Settings screen.

**[F-1]** Push to select LO frequency (the LED lights) or Tune frequency that is

changed by rotating [Main dial].

Push to turn the TS function ON or OFF.

① When the LED lights, the TS function is ON.

[TRANSMIT] is disabled during HDSDR operation.