

# SatPC32 (Scope Edition) and IC-9700

# Setup Instructions

Hi folks, I have written this instruction guide to help you set up the SatPC32 software developed by Erich Eichmann (DK1TB) with the Icom IC-9700. I encourage you to read through this guide before you get started and get an idea of the process, options and considerations. The outlined settings work for me and SatPC32. However, your mileage might vary, especially if you also use other software controlling the IC-9700. Please keep that in mind! Since SatPC32 is a very comprehensive program with lots of features and settings, this guide will only cover what is required to get the IC-9700 running. A detailed “User Manual” comes with the software and reading it is highly recommended. This guide is structured in three parts:

Part 1 Setting up the IC-9700;

Part 2 Installation of SatPC32 and control of the IC-9700;

Part 3 Enabling the SatPC32 “Scope” function.

To get started, I am making a few assumptions:

1. You have NOT connected the IC-9700 to your PC.
2. You have not installed SatPC32 on your PC.
3. These instructions are for Win10 (latest update).
4. You are using the latest version of SatPC32 (as of this writing it is “SatPC32 release Dec., 2019, incl scope)

## **WARNING!**

*Do not connect the radio to your PC with any USB cable until you have successfully installed the correct drivers. Many problems occur when the radio is connected without prior installation of the correct driver(s). Windows will install drivers at the moment you plug the radio in unless you already have the Silabs or Icom drivers installed.*

Now, there is some discussion over which drivers to install (Icom or Silabs). However, the Icom drivers are actually from Silicon Labs (Silabs) and I have always used Silabs drivers successfully on my PCs.

You get the latest drivers here: <https://www.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers>

Look for: Windows 10 Universal (v10.1.8).

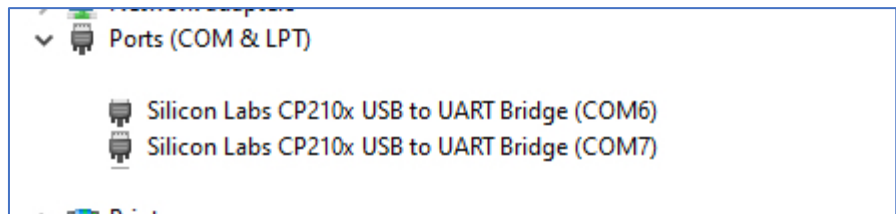
The Icom drivers are available here: [https://www.icom.co.jp/world/support/download/firm/IC-7600/usb1\\_30/](https://www.icom.co.jp/world/support/download/firm/IC-7600/usb1_30/)

If you have already successfully installed the drivers and the radio is working already with your PC go to Part 1, otherwise continue.

Please download either driver package and install the drivers (see success message by the installer). *If you connected the radio to the PC without the correct drivers, please look online for help on removing these drivers before proceeding and re-installing the correct drivers. Fixing this is beyond the scope of these instructions.*

Assuming you have successfully installed the drivers, use a USB cable to connect the radio to the PC and power on the radio. On your PC you will see a message of successful installation. Now, go to the “Device Manager” in Win10 to verify the correct port installation.

A quick way to do this is by clicking “WIN (Windows icon) + X” on the keyboard and select “Device Manager” from the pop-up menu. Now go to “Ports (COM & LPT) and review the COM ports. If everything is correctly installed, you will have *two new com ports*. In case of Silabs drivers they are both called: “Silicon Labs CP210x USB to UART Bridge (COM #)”. The “#” means your particular com ports. Now, the port with the lower number is the port for remote control. The port with the higher number is the “audio codec” (sound card) for sound (only). *Take note of the lower port number, which we will use in SatPC32.*



***Important!***

*Do not proceed unless you have the new com ports visible in the Device Manager. Repeat the process if necessary and/or delete the drivers and do a re-install. Only proceed if you have successfully completed this installation.*

Turn the radio on (if it is not on already) and we will now take a look at specific menus and settings.

We will make some changes to ports and settings that will allow you to have SatPC32 control the radio and use the new “Scope” function that now comes with SatPC32 if you choose to use the scope or not.

## Part 1      Setting up the IC-9700

On the IC-9700 front panel click on the [MENU] button and select [SET]. Scroll down to submenu 2/3 and select [Connectors] and [CI-V].

In submenu 1/3 of the [CI-V] you will see the following items: [CI-V Baud Rate], [CI-V Address], [CI-V Transceive] and [USB/LAN...]. These are settings that address the [Remote port] on the radio (see pages 1-3 and 13-3 in the basic IC-9700 manual).

[CI-V Baud Rate]:

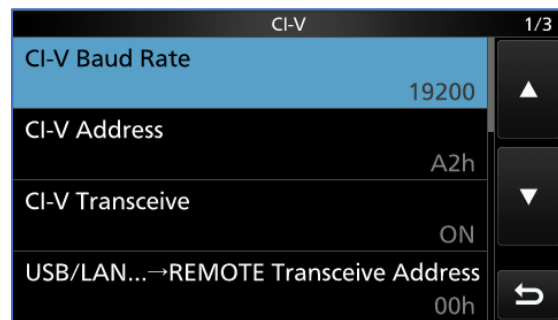
Select **CI-V Baud Rate** and set to **19200 baud**. That's the highest speed the [Remote port] can go. We will use this number later in SatPC32.

[CI-V Address]:

The default address is [A2h]. Leave this address as it is, unless you have a specific reason for changing it (e.g., other connected Icom radio with the same address). We will use the [A2H] address later in Satpc32.

[CI-V Transceive]

Default is [ON] and we leave it [ON]

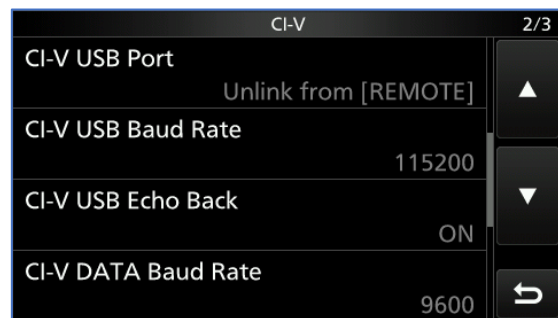


Now, scroll down to submenu 2/3. These settings will set the rear [USB] port on the radio.

Change the following settings:

[CI-V USB Baud Rate] Set to **115200**. As you can see the [USB port] can be set to a much higher speed than the [Remote port].

[CI-V USB Echo Back] set to **ON**.



The rest we will leave in the default setting. For the next few steps, keep the radio on and go back to the main radio screen by exiting out. That completes the radio setup for now.

## Part 2 Installation of SatPC32 and control of the IC-9700

Let's look at SatPC32. We will go over the software installation and getting the radio working in SatPC32.

### IMPORTANT!

*We will first set up the radio for the use of SatPC32 without enabling the Scope function (and previous versions of SatPC32). Since using the Scope function will require additional hardware (!) we will enable it in Part 3 of this guidance document.*

If you have not done so, please download the latest version of SatPC32 from Erich's website at: <http://www.dk1tb.de>

Please go to "Downloads" and select (as of this writing):

SatPC32 Demo 43MB, release Dec., 2019, includes spectrum scope for the IC-9700

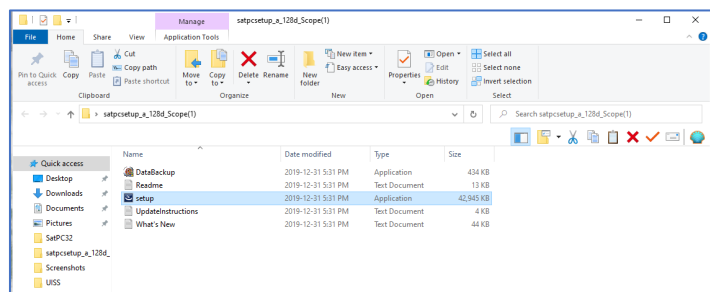
Now, this version is still 12.8d. Erich does not revise the version numbers frequently. Always look at the release date (currently Dec., 2019) which will include the latest version with some comments by Erich on new or revised functionality posted on top of this webpage.

If you have a previous installation of SatPC32 and customized settings like your registration, satellites etc., please run the backup utility in your SatPC32 version **FIRST!** You can find it under "Programs" – "DataBackup" in the main SatPC32 window menu bar on the top. If you had previous backups you will be asked if you want to "...replace the files in the destination". Select yes, if that is the latest backup with the settings you like to keep and quit the program once completed.

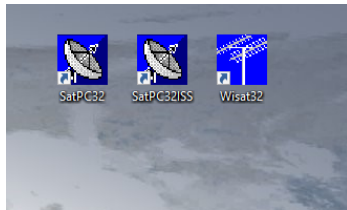
Now, use the Win10 program "Uninstaller" and uninstall your previous version of SatPC32.

Once you have the new software package downloaded and extracted, yes, please **uncompress/extract the downloaded file first (!)** right click on the installer (setup) and select "Run as administrator".

This will install SatPC32 on your PC. During the process, you will be asked to provide some information, like "User Name and Organization". You can fill it in or leave it blank. The installer will



also ask you what type of installation you like. Select “Typical” unless you have specific reasons for the other options.



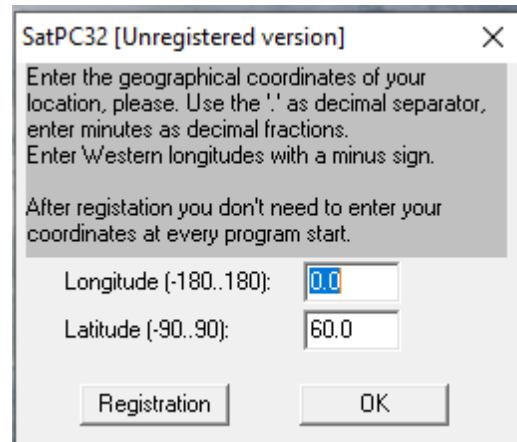
Once completed you will find three new icons on your Win10 desktop:

SatPC32, SatPC32ISS, and Wisat32

These are shortcuts to different programs. For the purpose of this guide we will only use the main program [SatPC32](#). Open SatPC32 and you will be greeted by a window asking you to enter your coordinates.

Now, here are a few important points:

1. As you can see in the window, this is at this point the “unregistered” version. To register you will need a license # that you can obtain from AMSAT by purchasing the software. I highly recommend you go to the AMSAT website store and purchase the license key.

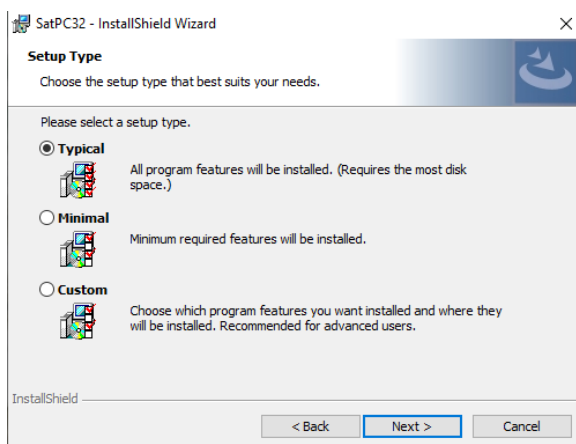


For AMSAT-NA go to: <https://www.amsat.org/product/satpc32-by-electronic-download/>

For AMSAT-DL go to: <https://shop.amsat-dl.org/produkt/satpc32/>

For AMSAT-UK go to: [https://shop.amsat-uk.org/SATPC32 - Satellite prediction software/p3815740\\_15628504.aspx](https://shop.amsat-uk.org/SATPC32_-_Satellite_prediction_software/p3815740_15628504.aspx)

Erich Eichman, DK1TB, has very graciously donated all the proceeds from the software to AMSAT in support of amateur satellites. Plus, you never pay for updates! Your purchase will support AMSAT and keeps amateur satellites in space. If you have a

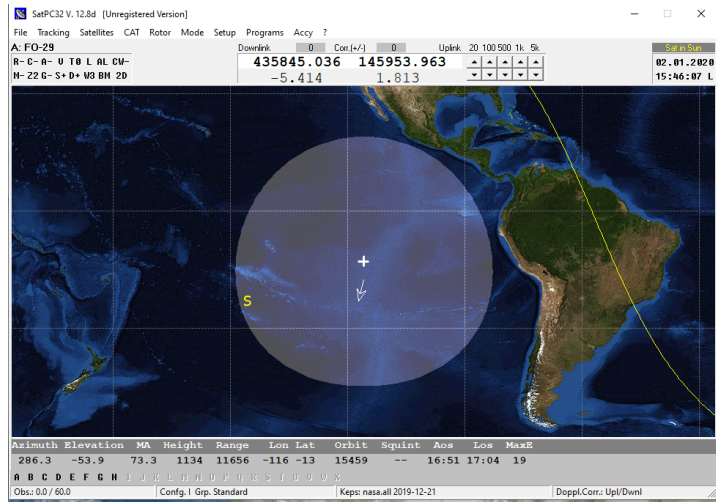


registration key, just select Registration and enter the required info. You are now ready to use the software.

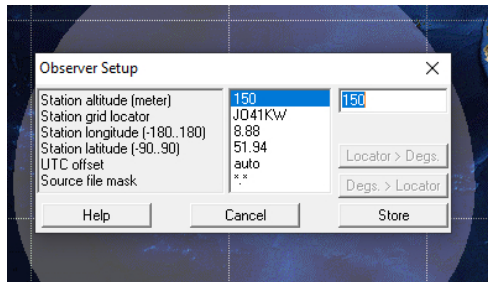
2. You can stay with the unregistered version and if you know your coordinates you can enter them in now or do it later. Or don't enter them at all for testing purposes. However, here is the caveat. Satellite prediction, doppler control etc., rely on your selected location. Whenever

you quit the program, you will lose your location in the unregistered version and you get the same opening window over and over again. Now, unless you know your exact coordinates and can enter them in, just click OK and start the main program. There is an easier way to set your coordinates if you know your grid locator.

3. If you already have a registration key from your previous version, it will still work. Since you made a “backup” as described earlier of all essential data (I assume), your registration key is included in that backup and you can just click OK.



Now, the main window is open. If you made a backup, load it now by selecting “Programs” in the main window top menu bar and go to “DataBackup”. Select “restore” and select to overwrite previous files. Once done quit the “DataBackup” program and go to “File” and “Quit” SatPC32. Start it again and all your previous settings and data (including registration) are now active.



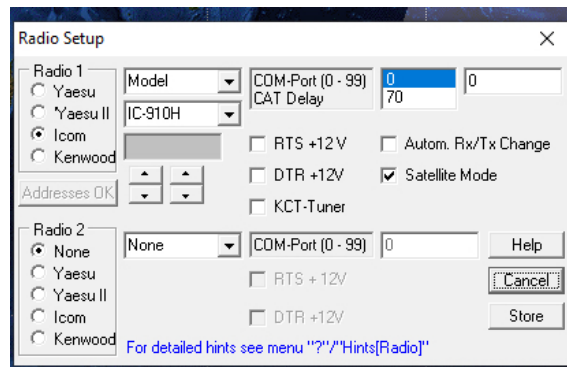
If you had no backup and are new to the program and have no registration you can set your coordinates by going to “Setup” in the main window top menu bar. Select “Observer” and click on “Station grid locator” in the small middle window. You can now enter **your grid locator** in the space (small window) to the right.

Once entered, click the “Locator > Degr” button and click yes (or “ja” if the German selection appears ☺) .

Now your coordinates are entered and once you click “Store” they are saved by the program.

Unfortunately, if you use the un-registered version it won't store the location information after restart. *Did I mention to support AMSAT and get a registration key?* ☺ Close the window (X).

BTW, if you have no previous experience with SatPC32, please read the “Manual” and



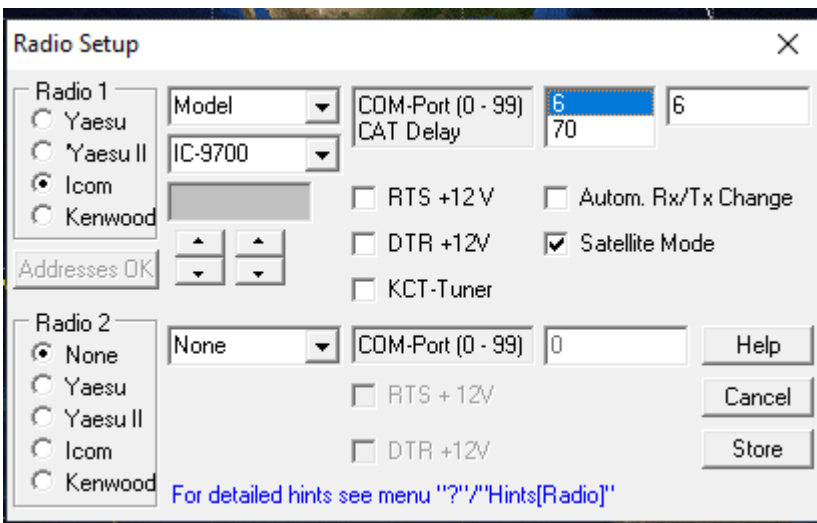


“Readme file” by clicking on the “?” in the main window top menu bar. Highly recommended!

Now, let’s set up the radio!

1. Go to “Setup” in the main window top menu bar. Select “Radio Setup” and a new window will pop open.
2. On the left top side you will select your radio manufacturer. Click on “Icom”
3. Click on “Model” in the pull down menu and select the “IC-9700” in the second pull down menu below.
4. Click on “model” again and now select “Baudrate” in the menu.. The pull down below has now changed and you select “115200”. This is the baud rate we selected on the IC-9700 earlier.
5. Now, click on the upper pull down menu again and select “Addresses”. Use the upper or lower LEFT arrow button below the address windows to change the address to “\$A2”. This is the unique radio for the IC-9700 that we saved in the radio. If you changed the radio’s address for whatever reason you need to enter the address you changed it to here in SatPC32. [Now, very important, before you close this window press the “Addresses OK” button and now all of the address windows should show \\$A2.](#) In case you wonder why you have four different address windows, they are for both TX and RX and two radios, in case you use a second Icom radio.

At this point, we need to select the correct com port. By default, the com port shows “0” in the “Radio Setup” window and “CAT Delay” is 70. Go to the far right entry window and select your



particular com port, which is the lower of the two Silab com ports. If you forgot, use the “Win + X” key combination (on your keyboard) again and go back to the “Device Manager” and “Ports”.

The picture shows my com port which is 6, it might not be yours! [Please enter your com port.](#)

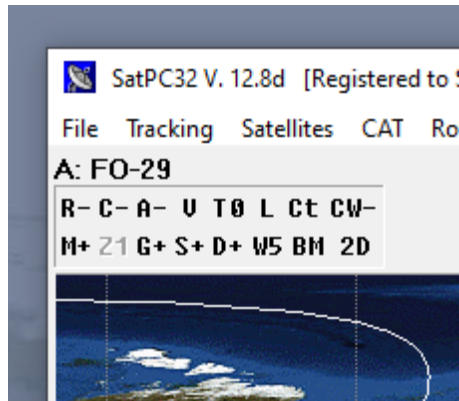
Leave all the selection boxes un-checked with the



exception of Satellite Mode. This will switch the radio automatically in satellite mode. There is also no need to change the CAT delay value.

Click “Store” to save your selection.

You should see a new window reminding you to restart the software to have the changes

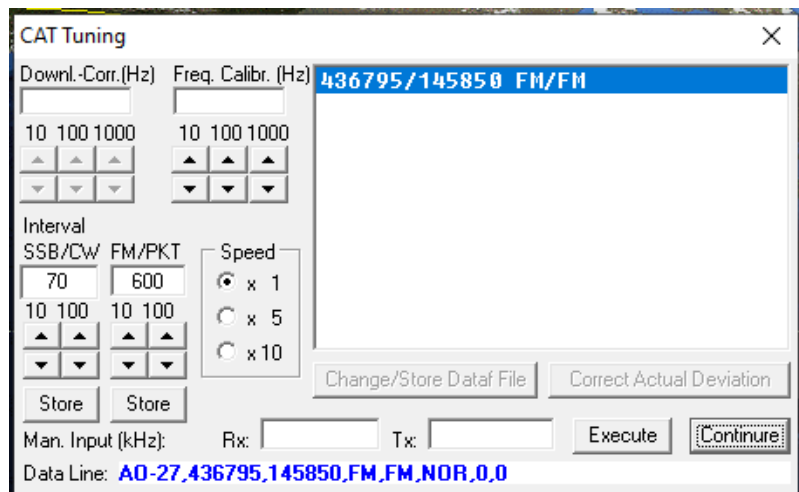


active. Click okay and restart the software. In the unregistered version, you will see the registration window again. Just click “OK”.

Let’s see if the radio works ☺. If you look at the top right corner of the main window, you see a small window with a number of letters and plus or minus signs.

Click on “C-” and it will change from C- to C+. This starts the CAT control and the radio is getting commands to change frequencies etc. Look at your radio and you should see the frequencies of whatever satellite is currently active. Now, select a different satellite by clicking on one of the letters in the lower right corner of SatPC32. It should change the active satellite in the software, with different frequencies and also the radio’s frequencies. You are using the default satellites that came with the software unless you have previous settings re-installed from the backup.

Many folks are wondering why the software changes the frequencies more or less constantly (look at the changes in hertz in the software) but nothing seems to happen or very infrequently on the radio. This is by design, since the software will only change the radio frequency in certain intervals on the radio. To see what these default intervals are, click on “CAT” in the upper menu of the main SatPC32 window. The “CAT Tuning” window will open and if you look at the “Interval” settings you see that the default selection is 70Hz for SSB/CW satellites and 600Hz for FM/PKT satellites. By clicking on the arrow keys below you can set the interval in both windows to “0”. Click “Store”



for each and “Continue” and see what happens to the radio. Now, it follows the frequency changes of the software immediately every 10Hz.

If you want to stop the CAT control of the radio just switch the “C+” back to “C-”.

**Congratulations! Your IC-9700 is connected and controlled by SatPC32.** If you don't want to use the “Scope” function in SatPC32, you are done. If you want to use it, let's go to Part 3.

## Part 3 Enabling the SatPC32 “Scope” Function

In this part, we will look at how to enable the “Scope” function in SatPC32.

As mentioned earlier, this will require additional hardware and changes to settings in SatPC32. Now, at this point, SatPC32 is controlling the IC-9700 through the USB port. That’s great. However, in order to use the scope function in SatPC32, the software needs the USB port to be solely available for streaming data to the software (scope) and this is a one-way street.

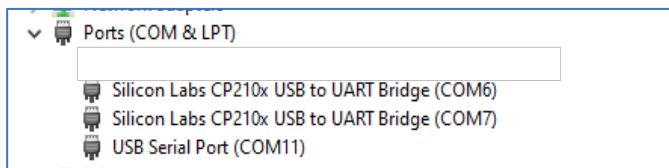
Trying to also control the frequency, doppler etc., via the same USB port is not possible (as per design of the software). Yes, other software packages can do that (e.g., Win4Icom) but not SatPC32. Therefore, we need to free up the USB port from any control functions. Now, the beauty of Icom radios is that they also have a “legacy” remote port on the back of the radio that allows for CI-V (CAT) commands to the radio and in the case of the IC-9700, this port runs independently from the USB port.

As mentioned before, this port is a legacy port of Icom radios and **will require an external interface**, like for example the original CT-17 level converter from Icom, or you can use a special CT-17/CI-V/USB cable preferably with a FTDI chipset. The Icom interface requires a separate power connection and a serial to USB converter if your PC does not have a legacy serial port. If you already have the Icom CT-17 interface use it. If not get a ~\$30 CT-17 USB FTDI Chipset CI-V Cat Control/Programming Cable (for example on Ebay, Amazon).



The benefit of using the [REMOTE] port for radio control is that you can use the scope function in SatPC32. That’s it, not more and not less. If you don’t want to use the “Scope” function just stop here and use your existing USB port. If you like to use the “Scope” function, you will need to connect the CT-17 cable to the PC. Once you do that, **a new and separate COM port** will be created on your PC. If you use a cable with the FTDI chipset, Win10 will install the driver automatically. If not, go to the FTDI website and get the latest driver: <https://www.ftdichip.com/Drivers/VCP.htm>

Once installed, open up the “Device Manager” by clicking again “WIN + X” on your keyboard and select “Device Manager” from the pop-up menu.



Take note of the **new** USB Serial Port (COM...). This port is in addition to the two Silab ports. This port number will be used in SatPC32 for the radio control. **On my PC this new port is COM 11.**

In the beginning, [we already set up the IC-9700 for both options](#). We had a [Remote Port] baud rate of 19200 and an [USB] baud rate of 115200. The radio address is: "A2h" and will stay the same since both ports will address the same radio. On the PC, we have two com ports for communicating to the radio. One for the USB connection (the lower of the two Silabs ports) and the other one for the CT-17 cable.

Here is what we will do now. We will tell SatPC32 to control the radio from the [Remote] port via CT-17 using that specific com port and a baud rate of 19200. We will also setup the "Scope" using the USB port (Silabs) and a speed of 115200 baud.

First things first:

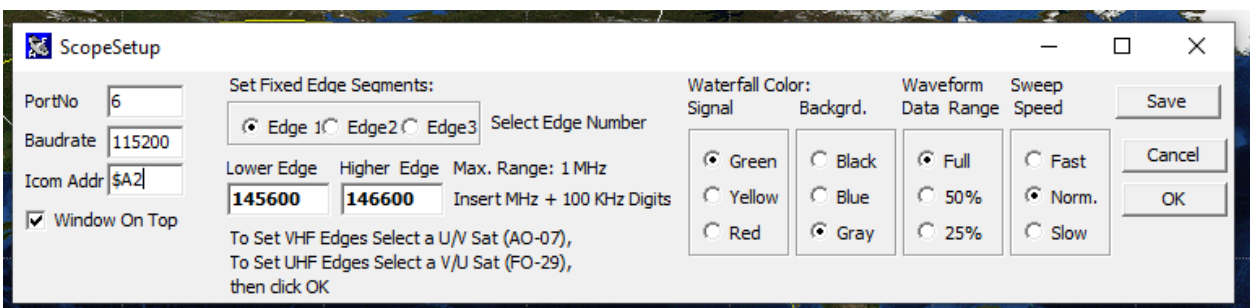
1. Go back to the SatPC32 main window and select "Radio Setup). As before set the baud rate. It will now be 19200. Once done, change the "COM-Port" to your com port for the CT-17. Once completed press "Store", restart SatPC32, enable "C+" and your radio should now display the frequencies of the satellite and the doppler changes. At this stage, you are controlling the radio via the Remote port and the USB port is not used.

#### [Trouble shooting \(if needed\):](#)

In case it is not working, verify the baud rate in the IC-9700 menu [CI-V Baud Rate [19200](#)], verify the [CI-V Address [A2h](#)] and the com port for the CT-17 interface on your PC. Compare those settings with your settings in SatPC32 under "Radio Setup". Once completed, shut down SatPC32 and afterwards turn OFF and then ON your IC-9700. Restart SatPC32, enable CAT control by switching the "C-" to "C+" and see if your radio is following the frequency changes.

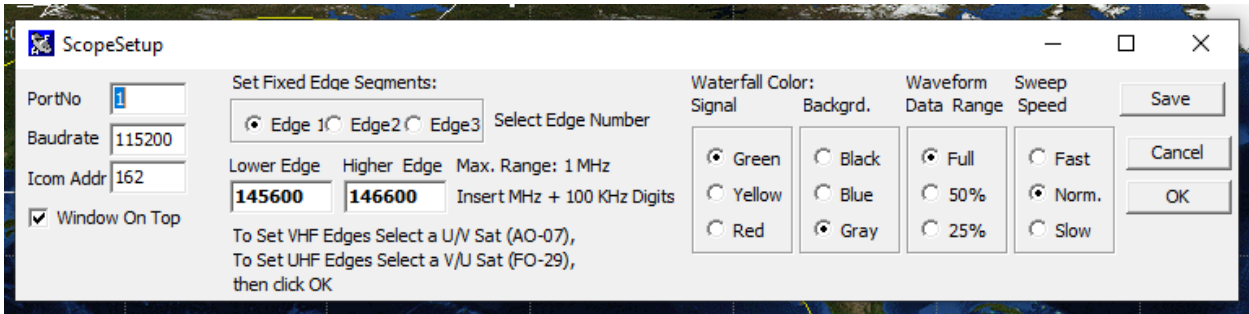
2. Now, that we have the radio working with the remote port, let's set up the "Scope".

We are going back to the "Setup" menu in SatPC32 and select the last item on the list which is "Scope Setup". Take a close look at the items and selections in the window.

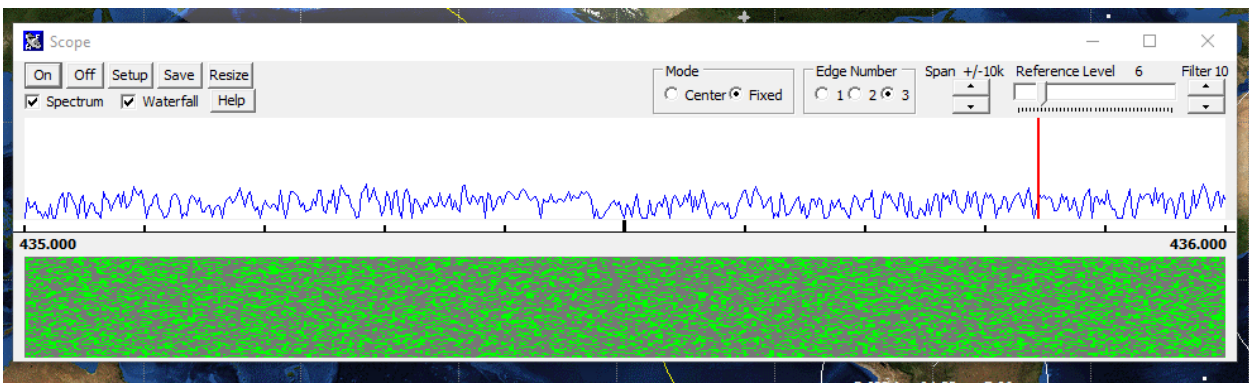


3. On the left top side we will need to enter our USB (Silabs) com port number in the "PortNo" field. Underneath is the "baud rate" and below that the Icom address.

- You can enter the Icom Address as \$A2 (hexadecimal) or 162 (decimal). They are both the same.



- For now leave the other settings as they can be changed later once you have everything up and running. Click "OK" and "Save" and quit this window.
- Go back to the "Setup" menu and select "Options". This window allows you to customize a lot of things within SatPC 32. For the purpose of this guide we will activate the "Enable Scope Functions" button and leave the other settings as they are. They are yours to discover later. ☺ Once done, click "Store" and restart SatPC32.
- Now, go back to the top menu and click on "Accy" in the upper menu bar. Click on "Spectrum" and the scope window will pop up and you are in business!



- While you are having the Scope window open, please click on the little "Help" button and read the provided information, especially for further setup of the scope and functions!
- How to use the "scope" in detail will be part of the next "Instruction Guide" (coming soon).

So, this concludes the instructions and I hope you enjoyed reading through this and getting your IC-9700 going with SatPC32. As mentioned earlier, there is a lot to learn about the software and the radio and I hope you will find some time to explore both.

If you found this guide helpful, have thoughts, comments, suggestions etc., please let me know. I am good on QRZ and frequently on the AMSAT-BB, the AMSAT Facebook page (<https://www.facebook.com/groups/AMSATNA/>) and the IC-9700 group (<https://www.facebook.com/groups/163460540873662/>).

I like to thank Erich Eichmann (DK1TB) and Mark Hammond (N8MH) for their input, suggestions and feedback!

73, Stefan VE4SW