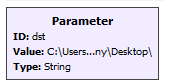
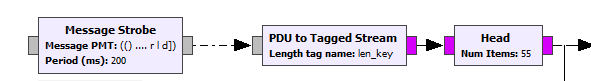
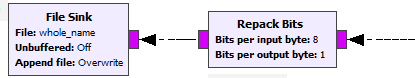
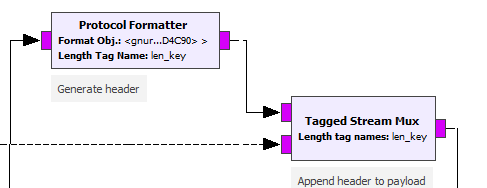
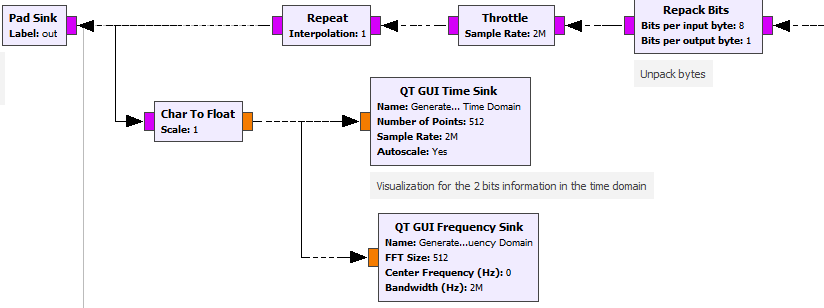
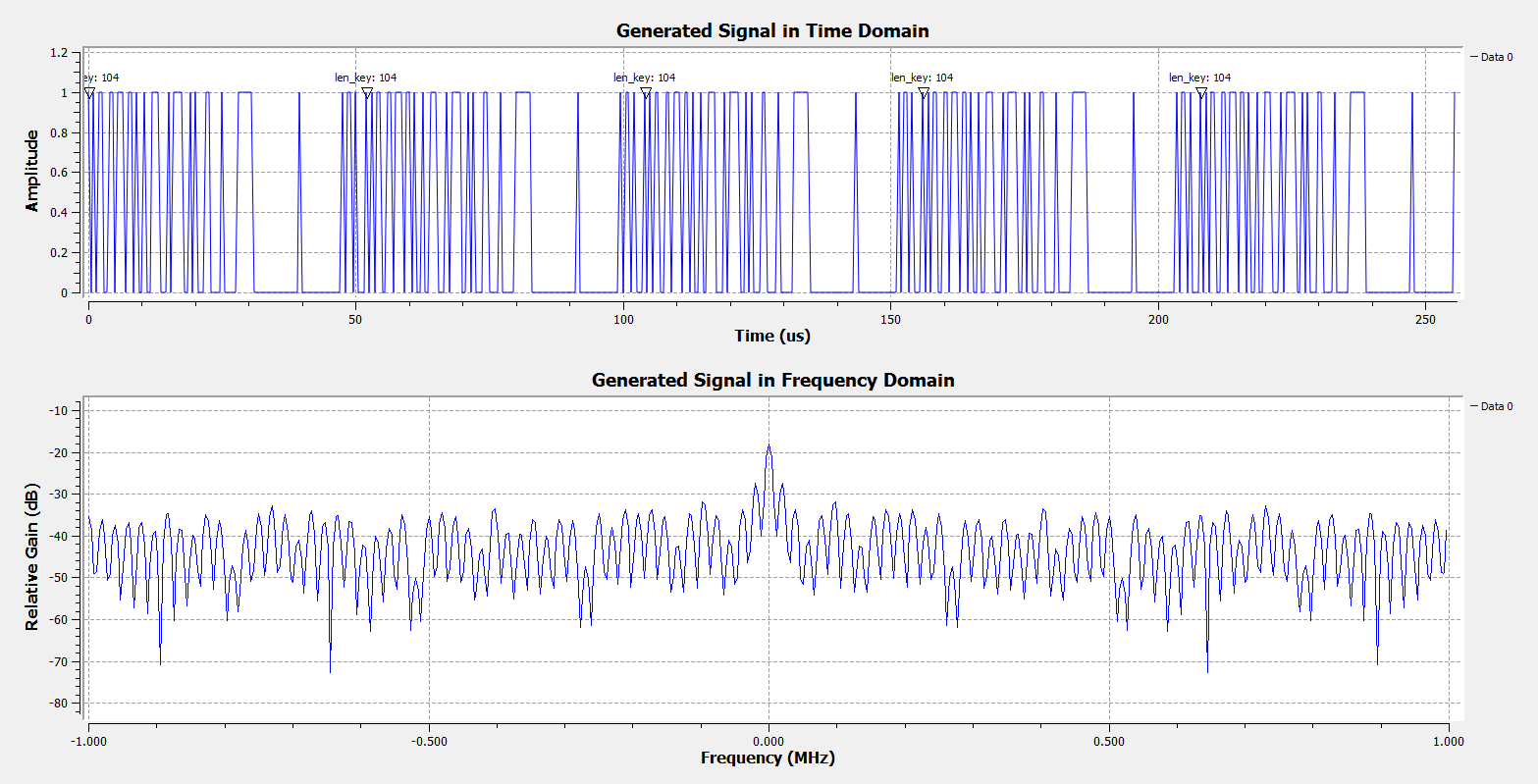
* Signal Generator:
  + Parameters:
    - **Dst**: Designation folder of all saved signal files
      * 
    - **Filename:** the name of the original digital signal transformed from test message
    - **Header Format:** Used to generate the access code attached to the beginning of each signal packet. During actual transmission mode, computer at the receiver side will check the access code first. If the error of access code is below the threshold. Then computer will regarded the following signal as target message. During the testing mode, access code will help to synchronize the reference signal and the received signal for bit error comparison.
      * GNUradio has build-in function to generate the access code *‘digital.header\_format\_default(digital.packet\_utils.default\_access\_code, 0)’*
    - **Interval\_ms:**  The interval time between two messages. The unit is ms so ‘200’ means 200ms.
      * In the heart rate simulation it is usually the interval time between two beats. So ….
    - **Message:**  The actual text message you want to send. One character is 1 byte long signal. For example, send “Helloworld” is actually sending 80 bits signals.
    - **Message\_RepeatTime:** How many times to you want to send the same message. To get an accurate Bit Error rate, we usually repeat the message several times and calculate the average Bit Error Rate. Here I repeat 5 times.
    - **Sample Rate**: The sample rate of generated signal., means number of discrete samples the computer will process per seconds.
      * Require to be >=2\*maximum frequency of processing signals.
      * In the function generator …
      * Sample rate should not within the chip capacity, usually smaller than clock rate
    - **Symbol Rate:** Number of symbols per second. For example, ‘a’ can be decode as ‘01100001’, if the symbol rate is 100 then each ‘1’/’0’ should last for 0.01 seconds.
      * The symbol rate should > actual need.
      * The symbol rate should < = sample rate, otherwise the computer is unable to process.
  + Process Details:
    - 
      * Generate text message for each Interval \_ms *(Interval \_ms = 200)* and convert that to digital stream. Use head to only transmit ‘len(message)\*(message\_repeatNum) ‘ digits. *(message\_repeatNum = 5, and len(message) = 11)*
    - 
      * Repack the 1 byte symbol into 8 bots and save the original signal file as reference when do bit error comparison *(whole\_name = dst + filename)*
    - 
      * Attach the access code to the message.
    - 
      * Repack the access-code-attached message symbol into 8 bits. Send that to the next stage in Pad Sink and also visualize them in Time Domain and Frequency Domain.
  + Example Screenshot: 
    - In the example screenshot I send one byte signal ‘H’. The length of access code is always 96. So the total length is 104 and the same pattern repeated for 5 times as you can see from the time domain.