

Options

Title: DCF77 Transmitter

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Output Language: Python

Generate Options: QT GUI

Complexity: 1.618mbal

Variable

ID: samp_rate

Value: 192k

Variable

ID: freq_DCF77

Value: 77.5k

Import

Import: math

Import

Import: zmq

Variable

ID: decimation

Value: 12

Variable

ID: chip_size

Value: 25

Windows needs the
import of zmq

Tag Object

ID: minute_tag

Offset: 60

Key: key

Value: min

Source ID: src

Vector Source

Vector: (0,0,1,1,1,0,0,0,0...

Tags: min

Repeat: Yes

example DCF77 encoded
bit-stream (for OOK)
(with random weather
data bits)
full length: must be
60 elements, the last
element must be a 2

ZMQ SUB Source

Address: tcp://1....0.1:55552

Timeout (msec): 100

Pass Tags: No

Filter Key:

Repeat

Interpolation: 16k

repeat time bits
over full frame
of second

Vector Source

Vector: list(int(0.1*samp_...

Tags:

Repeat: Yes

Vector Source

Vector: list(int(0.2*samp_...

Tags:

Repeat: Yes

Vector Source

Vector: list(int(samp_rate...

Tags:

Repeat: Yes

Vector Source

Vector: list(int(samp_rate...

Tags:

Repeat: Yes

waveform for 2 (new minute)
(amplitude modulation)

Note

Note:

DCF77 OOK
amplitude
modulation

Synchronous
Waveform Selector

selects the OOK-
waveform to the
corresponding
symbol 0, 1 or 2

Short To Float

Scale: 1

Null Sink

QT GUI Time Sink

Name: Baseband_DCF77_signal

Number of Points: 64k

Sample Rate: 16k

Autoscale: No

Magnitude and Phase To Complex

out

in

Virtual Sink

Stream ID: 0

Vector Source

Vector: (1,1,1,1,1,1,1,1,1...

Tags:

Repeat: Yes

example DCF77 encoded
bit-stream (for phase modulation)
full length: must be 60 elements,
the last element must be a 2

Vector Source

Vector: list(int(0.2*samp_...

Tags:

Repeat: Yes

waveform for 0
(phase modulation)

Python Module

ID: DCF77_code

Multiply Const

Constant: -1

bit-flipped waveform
for 1
(phase modulation)

Vector Source

Vector: list(int(0.2*samp_...

Tags:

Repeat: Yes

waveform for 2 (new minute)
(phase modulation)

Repeat

Interpolation: 16k

repeat time bits
over full frame
of second

DCF77
phase
modulation

Repeat

Interpolation: 25

repeat time bits
over full frame
of second

Repeat

Interpolation: 25

repeat time bits
over full frame
of second

Repeat

Interpolation: 25

repeat time bits
over full frame
of second

Repeat

Interpolation: 25

repeat time bits
over full frame
of second

Note

Note:

DCF77
phase
modulation

Synchronous
Waveform Selector

selects the phase-
waveform to the
corresponding
symbol 0, 1 or 2

Short To Float

Scale: 1

Null Sink

Multiply Const

Constant: 500m

Signal Source

Sample Rate: 192k

Waveform: Cosine

Frequency: 77.5k

Amplitude: 1

Offset: 0

Initial Phase (Radians): 0

modulation signal to shift the
pass band signal to 77.5 kHz

Tags Strobe

Value (PMT): sec

Key (PMT): S

Num. Samples: 192k

set a tag each second

Add

QT GUI Time Sink

Name: Modulate..._signal_time

Number of Points: 768k

Sample Rate: 192k

Autoscale: No

TCP Sink

Mode: Server

Port: 55.553k

Virtual Source

Stream ID: 0

Repeat

Interpolation: 12

each bit stretches a number
of "samp_rate" samples,
i.e. fill one full second

Multiply

QT GUI Frequency Sink

Name: Modulate...al_frequency

FFT Size: 1024

Center Frequency (Hz): 0

Bandwidth (Hz): 192k