

Options

Title: ALS162 Transmitter  
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Output Language: Python  
Generate Options: QT GUI

Complexity: 1.507mbal

Import

Import: np

Import

Import: pmt

Variable

ID: samp\_rate  
Value: 192k

Variable

ID: subframes\_minute  
Value: 40

Variable

ID: freq\_ALS162  
Value: 162k

Tag Object

ID: minute\_tag  
Offset: 60  
Key: key  
Value: min  
Source ID: src

Vector Source

Vector: (0,0,0,0,0,0,1,0,0...  
Tags: min  
Repeat: Yes

example ALS162 encoded  
bit-stream full length: must  
be 60 elements, the last  
element must be a 2  
===  
time: 17:43  
weekday: Monday  
Date: 01.05.23

ZMQ SUB Source

Address: tcp://1....0.1:55552  
Timeout (msec): 100  
Pass Tags: No  
Filter Key:

Note

Note:

Note that these  
waveforms are in  
perfect sync to  
each other

Repeat

Interpolation: 40

Vector Source

Vector: list(1\*[+1,-1,-1,+...  
Tags:  
Repeat: Yes

derivative of waveform for 0

Vector Source

Vector: list(1\*[+1,-1,-1,+...  
Tags:  
Repeat: Yes

derivative of waveform for 1

Vector Source

Vector: list(subframes\_min...  
Tags:  
Repeat: Yes

derivative of waveform for 2  
(new minute)

Waveform Selector

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

Null Source

Throttle

Sample Rate: 1k

Null Sink

Virtual Source

Stream ID: 0\_a

Virtual Source

Stream ID: 0\_b

Repeat

Interpolation: 4.8k

Repeat

Interpolation: 4.8k

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

IIR Filter

Feed-forward Taps: 1, 0  
Feedback Taps: 0, 1

integrator to obtain  
the desired base band  
waveform

QT GUI Time Sink

Name: ALS162 symbols  
Number of Points: 384k  
Sample Rate: 192k  
Autoscale: No

Multiply Const

Constant: 208.333u

normalize signal  
to range [-1, 1]

Virtual Sink

Stream ID: 1

QT GUI Time Sink

Name: Baseband ALS162 Signal  
Number of Points: 384k  
Sample Rate: 192k  
Autoscale: No

Constant Source

Constant: 1

Virtual Source

Stream ID: 1

Magnitude and Phase To Complex

as the ALS162 signal  
is mainly defined by the phase

Signal Source

Sample Rate: 192k  
Waveform: Cosine  
Frequency: 162k  
Amplitude: 1  
Offset: 0  
Initial Phase (Radians): 0

modulation signal to shift the  
pass band signal up to 162 kHz

Multiply

QT GUI Frequency Sink

Name: Modulate...al\_frequency  
FFT Size: 1024  
Center Frequency (Hz): 0  
Bandwidth (Hz): 192k

QT GUI Time Sink

Name: Modulate...signal\_time  
Number of Points: 768k  
Sample Rate: 192k  
Autoscale: No

TCP Sink

Mode: Server  
Port: 55.553k