

SatVHR - Transmissor UHDRTX via CAN

Este projeto permite comunicação com o transmissor µHDRTX usando uma interface CAN, via PCAN-USB Pro.

Estrutura

- `UHDRPCAN.py` : classe principal que implementa os comandos CAN.
- `uhdrtx.py` : aplicação principal que usa a classe `UHDRPCAN` .
- `can1listen.py` : emulador do transmissor (simula respostas no barramento CAN).
- `venv/` : ambiente virtual Python.

Pré-requisitos

- Interface **PCAN-USB Pro**
- Python 3 com `python-can` instalado

Instalação

```
pip install python-can
```

Configuração da interface CAN

Configure as duas interfaces CAN (exemplo com `can0` e `can1`):

```
sudo ip link set can0 type can bitrate 500000
sudo ip link set can1 type can bitrate 500000

sudo ip link set can0 up
sudo ip link set can1 up
```

Uso

Para rodar o emulador do transmissor:

```
python3 can1listen.py
```

Para usar a aplicação e se comunicar com o transmissor real:

```
python3 uhdrtx.py
```

Exemplo:

```
(venv) lablinux@lablinux:~/Documents/SatVHR/design_workspace/TXX$ python uhdrtx.py
ID: 'HDTx' (0x48445478)

Serial: 3735928559 (0xDEADBEEF)

SW Version: 03.01.03 (0x00030103)

FW Version: 02.02.03 (0x00030202)

HW Version: 01.03.03 (0x00030301)

Uptime: 65535 seconds (0x0000FFFF)

Scratchpad: 0x00000000

Scratchpad: 0x01020304

CAN0_Status: 0x00000000
Invalid_Address: False
```

Out_Of_Range: False
Not_Writeable: False
Internal_Err: False

CAN0_Conf: 0x00000000
Address: 0 (0x00)

Status: 0x000F
I2C_Status (bit 0): 1
CAN0_Status (bit 1): 1
CAN1_Status (bit 2): 1
RF_Status (bit 8): 0
PA0_Status (bit 9): 0
PA1_Status (bit 10): 0
Cal_Status (bit 11): 0
TempStatus (bit 12): 0
Brd_Curr_Status (bit 13): 0
Brd_Volt_Status (bit 14): 0
Timeout_Status (bit 15): 0

RF_Status: 0x0002
RF_Synth_Lock (0 = locked) (bit 0): 0
RFDAC_OverTemp (bit 1): 1
RFDAC_Lock (0 = locked) (bit 2): 0

Board Temp : 25.00°C (raw=0x0064)
RFDAC Temp : 25.00°C (raw=0x0064)

FPGA Temp : 25.00°C (raw=0x0064)

Currents:
Board_VBAT: 0.100 mA (raw=0x0064)
FPGA_PWR: 0.100 mA (raw=0x0064)
PA_0: 0.101 mA (raw=0x0065)
PA_1: 0.101 mA (raw=0x0065)
RF_CH0: 0.102 mA (raw=0x0066)
RF_CH1: 0.102 mA (raw=0x0066)
Freq_Ref_1V8: 0.103 mA (raw=0x0067)
Freq_Ref_3V3: 0.103 mA (raw=0x0067)
RF_Synth_3V3: 0.104 mA (raw=0x0068)
RF_DAC_1V8: 0.104 mA (raw=0x0068)
RF_DAC_1V: 0.105 mA (raw=0x0069)

Voltages:
Reserved: 0.100 mV (raw=0x0064)
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Reserved: 0.101 mV (raw=0x0065)
Reserved: 0.101 mV (raw=0x0065)
RF_CH0: 0.102 mV (raw=0x0066)
RF_CH1: 0.102 mV (raw=0x0066)
Freq_Ref_1V8: 0.103 mV (raw=0x0067)
Freq_Ref_3V3: 0.103 mV (raw=0x0067)
RF_Synth_3V3: 0.104 mV (raw=0x0068)
RF_DAC_1V8: 0.104 mV (raw=0x0068)
RF_DAC_1V: 0.105 mV (raw=0x0069)
Reserved: 0.105 mV (raw=0x0069)

Mode: Standby
Busy: 0
Error: 0

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Busy: 0
Error: 0

Reserved: 0 (0x00)

RollOff: 0 (0x00)
Pilots: 0 (0x00)
ModCod: 1 (0x01)

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Pilots: 0 (0x00)
ModCod: 1 (0x01)

Data source: SERDES 1 (1 / 0x01)

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Symbol Rate: 16711935 (0X00FF00FF)

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Target PA power: 255 dBm

Target PA power: 255 dBm

CH0 Frequency: 515 MHz

CH1 Frequency: 515 MHz

CH3 Frequency: 515 MHz

CH4 Frequency: 515 MHz

PA0 Status:
 IsOn: False
 OverCurrent: False
 OverTemp Level: 0 (0=OK, 1=Warn, 2=High, 3=Critical)
 Disconnected: False
 Timeout: False
 Output Power: 20.0 dBm (raw=0)
 Temperature: 25.00 °C (raw=100)

PA1 Status:
 IsOn: False
 OverCurrent: False
 OverTemp Level: 0 (0=OK, 1=Warn, 2=High, 3=Critical)
 Disconnected: False
 Timeout: False
 Output Power: 20.0 dBm (raw=0)
 Temperature: 25.00 °C (raw=100)

PA0 Status1:
 Measured Current: 0.0 mA (raw=0)
 Power Quanta: 100 (raw=0x0064)

PA1 Status1:
 Measured Current: 0.0 mA (raw=0)
 Power Quanta: 100 (raw=0x0064)