
LoRaWAN IoT Sensor

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Date:	2020-11-17

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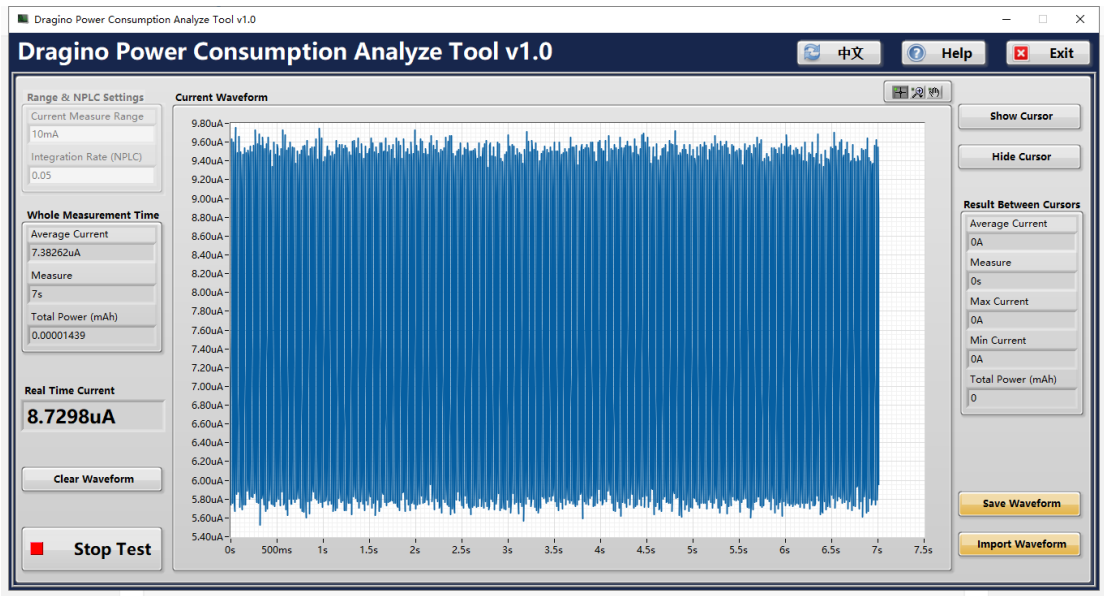
1. EU868 Power consumption test results

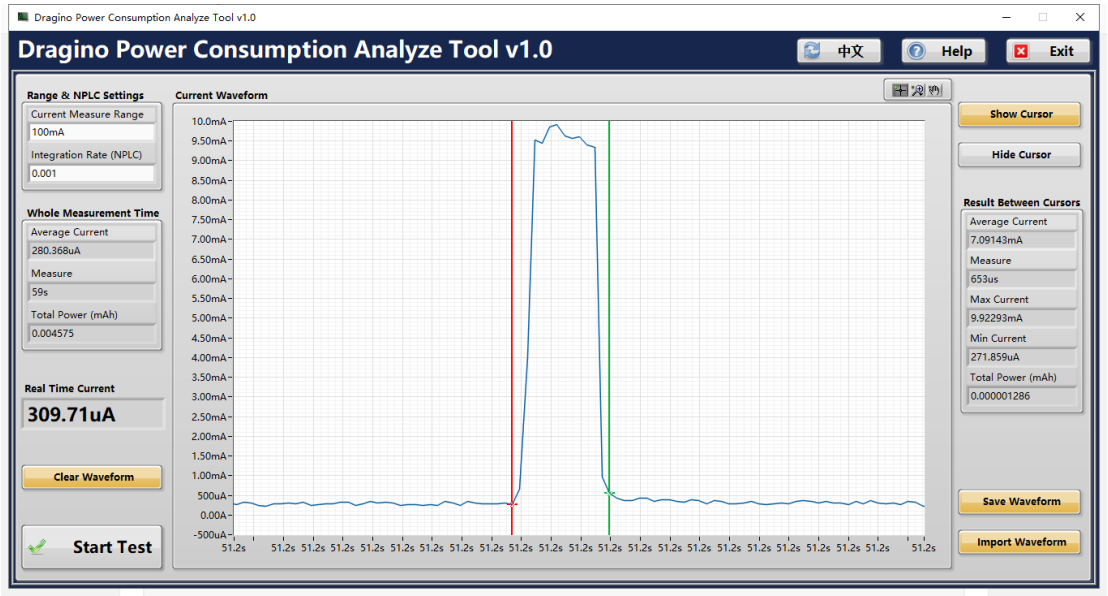
1.1 Deep Sleep

Average: 9uA=0.009mA



1.2 Watchdog power

Max 9.92293mA Average 7.09143mA in 653us for every 18 seconds (watchdog period)



1.3 DR=0,TXP=0

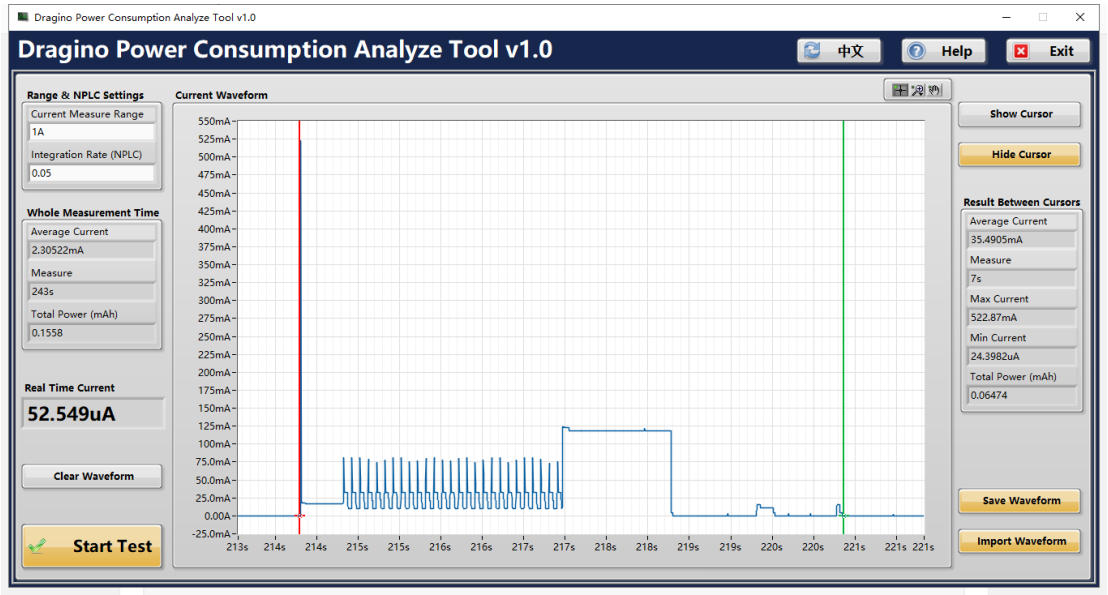
Send packet

Transmit: 7s

Average Current in transmit time: 35.4905mA

The total current to send a packet is

35.4905mA * 7s = 248.4335mA*s



Analyze Result

With Above test result and battery info, we can estimate the battery life.

For example, if we set the device to a sensor node with DR=0, an uplink will be sent every hour., Transmit one uplink every one hour.

The average current for the end node composed of:

- ✓ Deep Sleep Mode Power Consumption in one period :0.009mA *60*60s=(32.4mA*s)
- ✓ Watch Dog Current Power Consumption in one period : 0.000653 s*7.1mA*(60*60s/18s) =(0.000023mA *s)
- ✓ Sampling & Uplink & Downlink Power Consumption Power Consumption in one period. **248.4335** mA * s

Current is :(32.4mA*s + 0.000023mA*s+ 248.4335 mA*s)/(60*60s)= 0.07801mA.

The battery used in LDDS75 is 4000mAh and of stable voltage in the most of life. With considering a max 2% discharge rate from the battery spec.So the battery life is y. so

4000(1 - 2%*y) =**0.07801**mA * 24 * 365 * y

So 4000 – 80*y = **AV_CURRENT** * 8760 *y

So 4000=(**AV_CURRENT** * 8760 +80) * Y

So Y = 4000/ (**AV_CURRENT** * 8760+80) = 4000/ (**0.07801*** 8760+80) = 5.2(Years)

1.4 DR=5,TXP=0

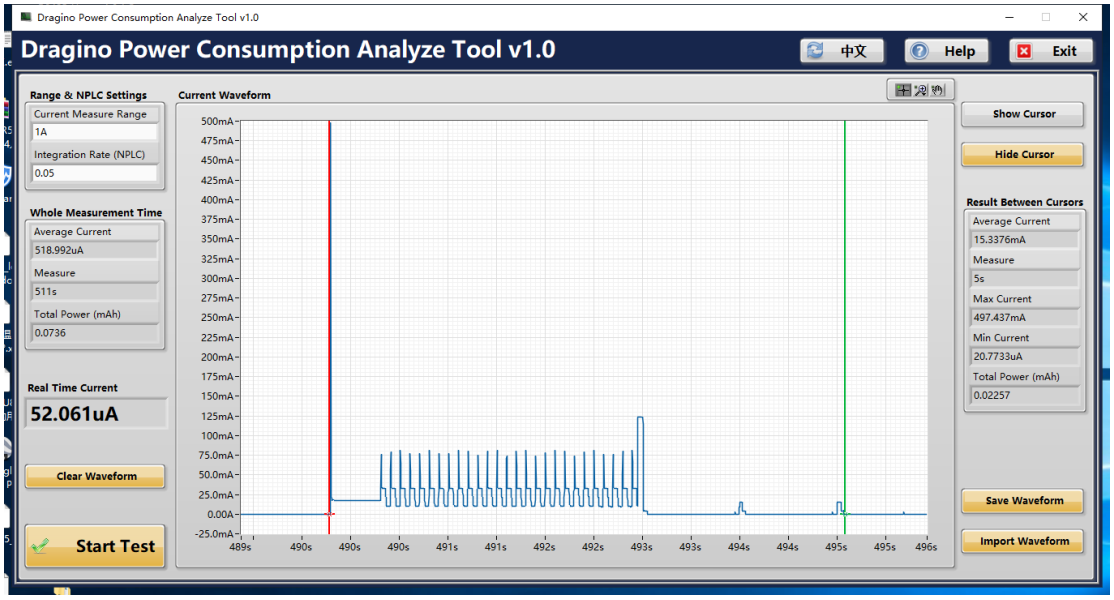
Send packet

Transmit: 5s

Average Current in transmit time: 15.3376mA

The total current to send a packet is

15.3376mA * 5s = 76.688mA*s



Analyze Result

With Above test result and battery info, we can estimate the battery life.

For example, if we set the device to a sensor node with DR=5, an uplink will be sent every hour., Transmit one uplink every one hour.

The average current for the end node composed of:

- ✓ Deep Sleep Mode Power Consumption in one period :0.009mA *60*60s=(32.4mA*s)
- ✓ Watch Dog Current Power Consumption in one period : 0.000653 s*7.1mA*(60*60s/18s) =(0.000023mA *s)
- ✓ Sampling & Uplink & Downlink Power Consumption Power Consumption in one period. **76.688** mA * s

Current is :(32.4mA*s + 0.000023mA*s+ 76.688 mA*s)/(60*60s)= 0.0303mA.

The battery used in LDDS75 is 4000mAh and of stable voltage in the most of life. With considering a max 2% discharge rate from the battery spec.So the battery life is y. so

4000(1 - 2%*y) =**0.0303**mA * 24 * 365 * y

So 4000 – 80*y = **AV_CURRENT** * 8760 *y

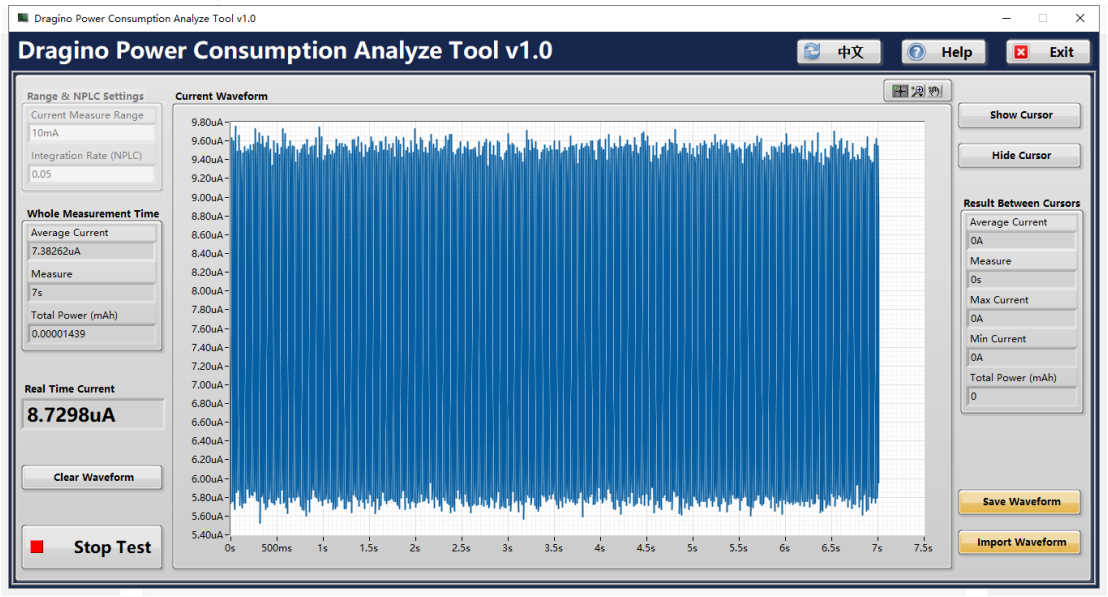
So 4000=(**AV_CURRENT** * 8760 +80) * Y

So Y = 4000/ (**AV_CURRENT** * 8760+80) = 4000/ (**0.0303*** 8760+80) = 11.5(Years)

2. US915 Power consumption test results

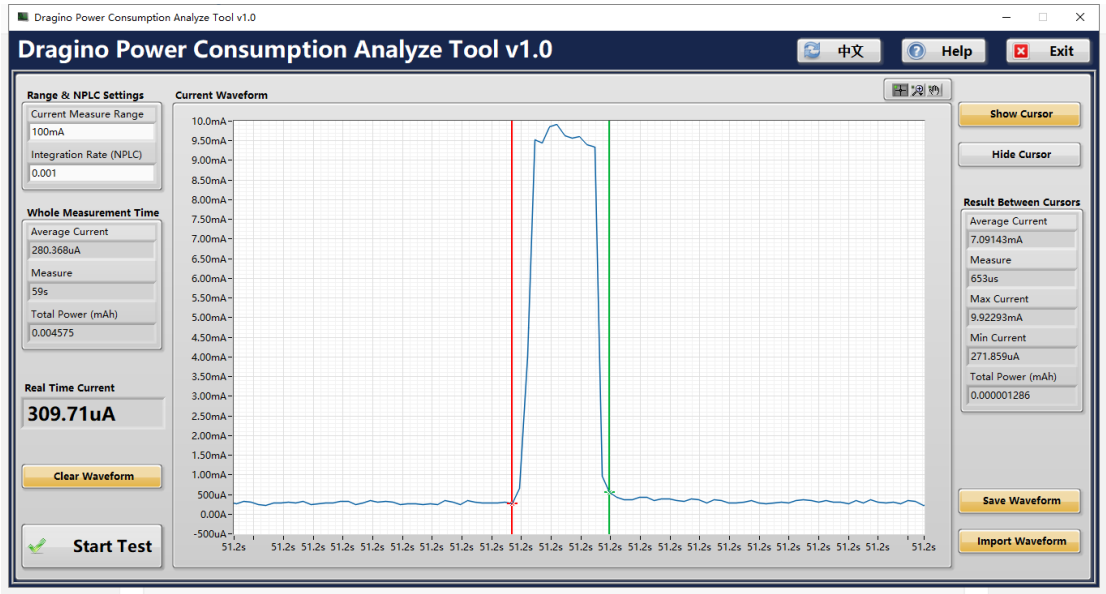
2.1. Deep Sleep

Average: 9uA=0.009mA



2.2. Watchdog power

Max 9.92293mA Average 7.09143mA in 653us for every 18 seconds (watchdog period)



2.3. DR=0,TXP=0

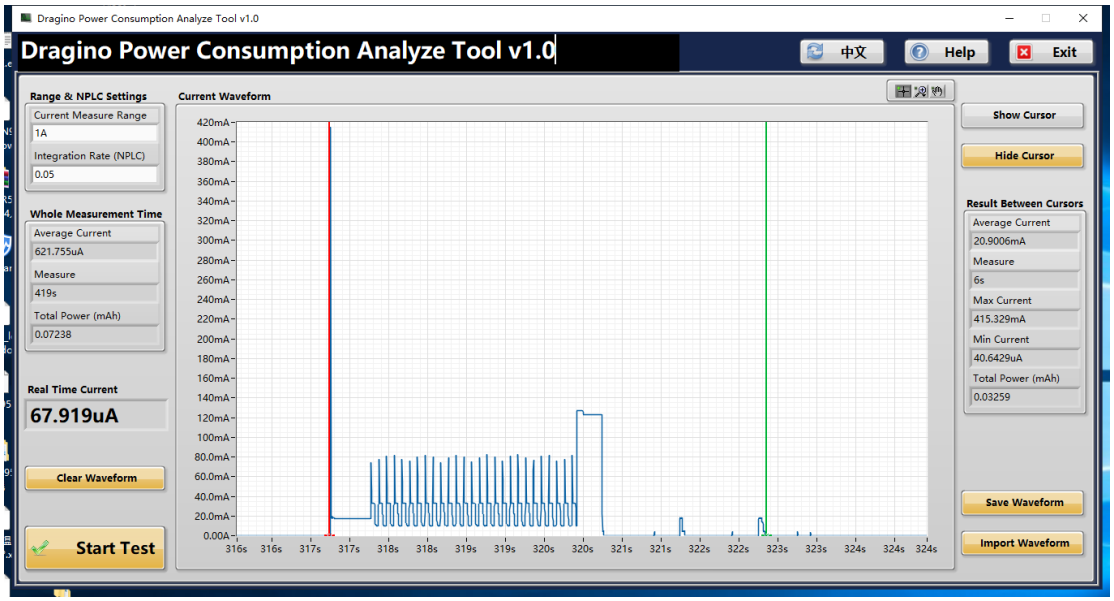
Send packet

Transmit: 6s

Average Current in transmit time: 20.9006mA

The total current to send a packet is

20.9006mA * 6s = 125.4036mA*s



Analyze Result

With Above test result and battery info, we can estimate the battery life.

For example, if we set the device to a sensor node with DR=0, an uplink will be sent every hour., Transmit one uplink every one hour.

The average current for the end node composed of:

- ✓ Deep Sleep Mode Power Consumption in one period :0.009mA *60*60s(32.4mA*s)
- ✓ Watch Dog Current Power Consumption in one period : 0.000653 s*7.1mA*(60*60s/18s) =(0.000023mA *s)
- ✓ Sampling & Uplink & Downlink Power Consumption Power Consumption in one period. 125.4036 mA * s

Current is :(32.4mA*s + 0.000023mA*s+ 125.4036 mA*s)/(60*60s)= 0.0438mA.

The battery used in LDDS75 is 4000mAh and of stable voltage in the most of life. With considering a max 2% discharge rate from the battery spec.So the battery life is y. so

4000(1 - 2%*y) =0.0438mA * 24 * 365 * y

So 4000 – 80*y = AV_CURRENT * 8760 *y

So 4000=(AV_CURRENT * 8760 +80) * Y

So Y = 4000/ (AV_CURRENT * 8760+80) = 4000/ (0.0438* 8760+80) = 8.6(Years)

2.4. DR=3,TXP=0

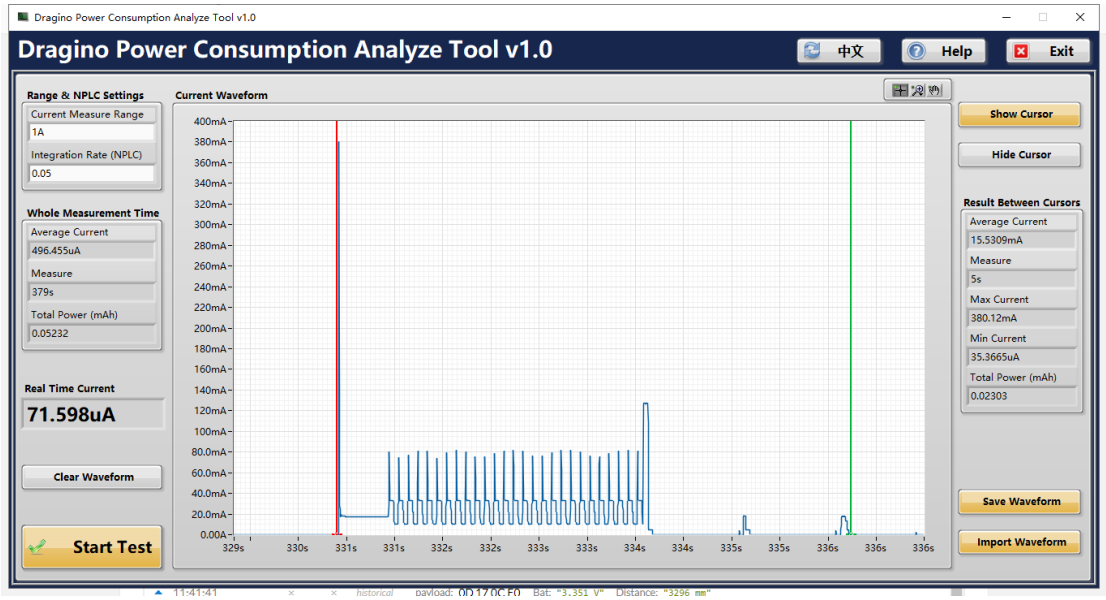
Send packet

Transmit: 5s

Average Current in transmit time: 15.5309mA

The total current to send a packet is

15.5309mA * 5s = 77.6545mA*s



Analyze Result

With Above test result and battery info, we can estimate the battery life.

For example, if we set the device to a sensor node with DR=3, an uplink will be sent every hour., Transmit one uplink every one hour.

The average current for the end node composed of:

- ✓ Deep Sleep Mode Power Consumption in one period :0.009mA *60*60s(32.4mA*s)
- ✓ Watch Dog Current Power Consumption in one period : 0.000653 s*7.1mA*(60*60s/18s) =(0.000023mA *s)
- ✓ Sampling & Uplink & Downlink Power Consumption Power Consumption in one period. **77.6545** mA * s

Current is :(32.4mA*s + 0.000023mA*s+ 77.6545 mA*s)/(60*60s)= 0.03057mA.

The battery used in LDDS75 is 4000mAh and of stable voltage in the most of life. With considering a max 2% discharge rate from the battery spec.So the battery life is y. so

4000(1 - 2%*y) =**0.03057**mA * 24 * 365 * y

So 4000 – 80*y = **AV_CURRENT** * 8760 *y

So 4000=(**AV_CURRENT** * 8760 +80) * Y

So Y = 4000/ (**AV_CURRENT** * 8760+80) = 4000/ (**0.03057*** 8760+80) = 11.5(Years)