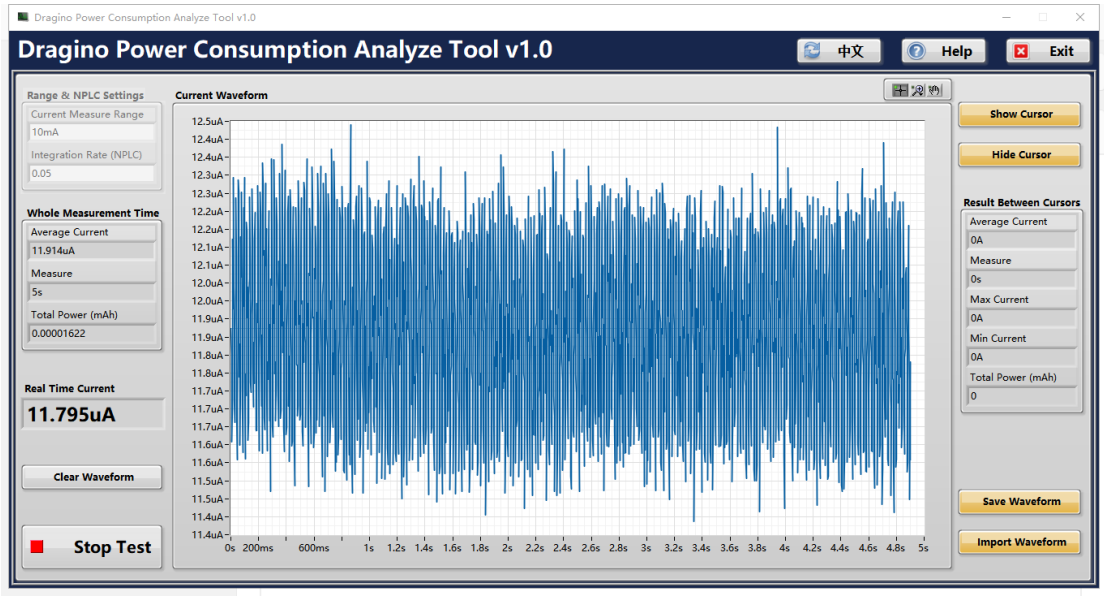
Test Engineer:	Lu Herong
Date:	2020-11-20

1. Test Result

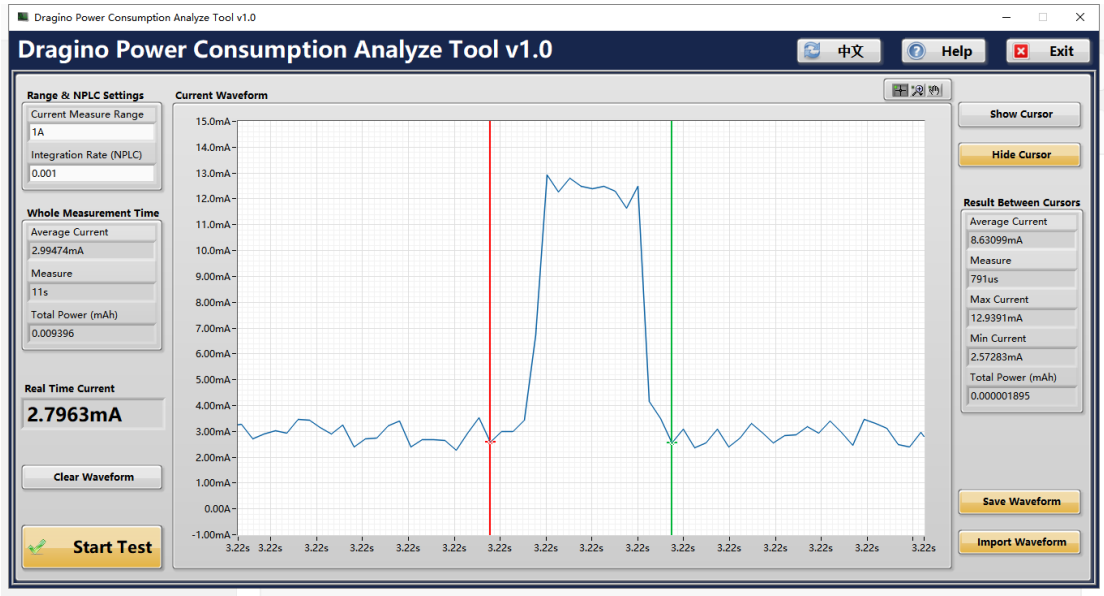
1. 1. Deep Sleep Mode

Average:12uA



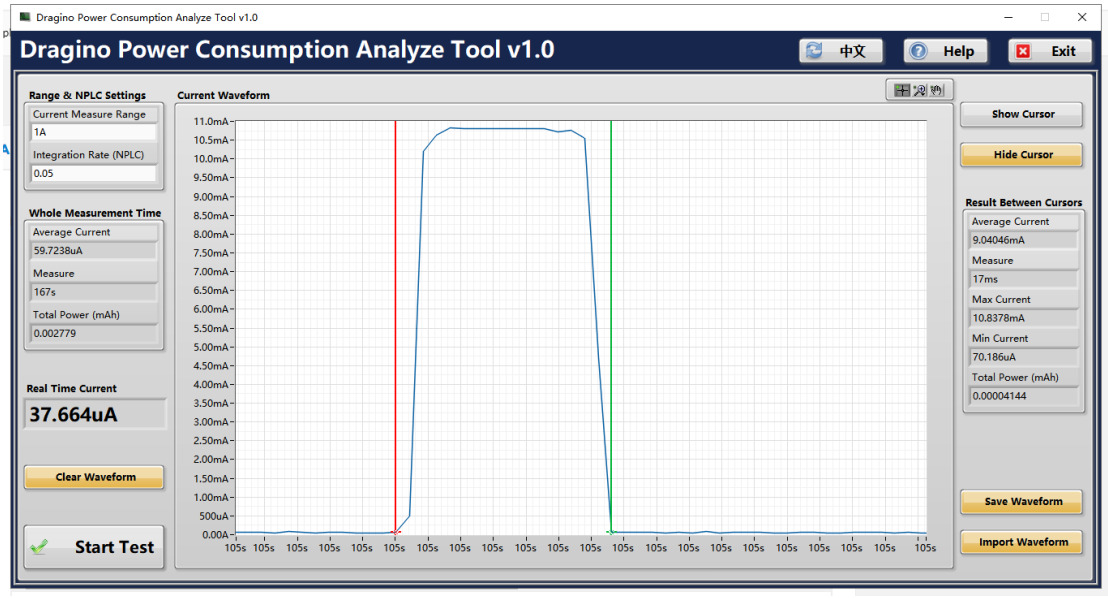
1. 2. Watchdog Power

Average 8.631mA in 791us for every 18 seconds (watchdog period)



1. 3. Alarm Power Consumption

Average 9.0405mA in 17ms for every 1 minute



1. 4. EU868

1. 4. 1. DR=0,TXP=0

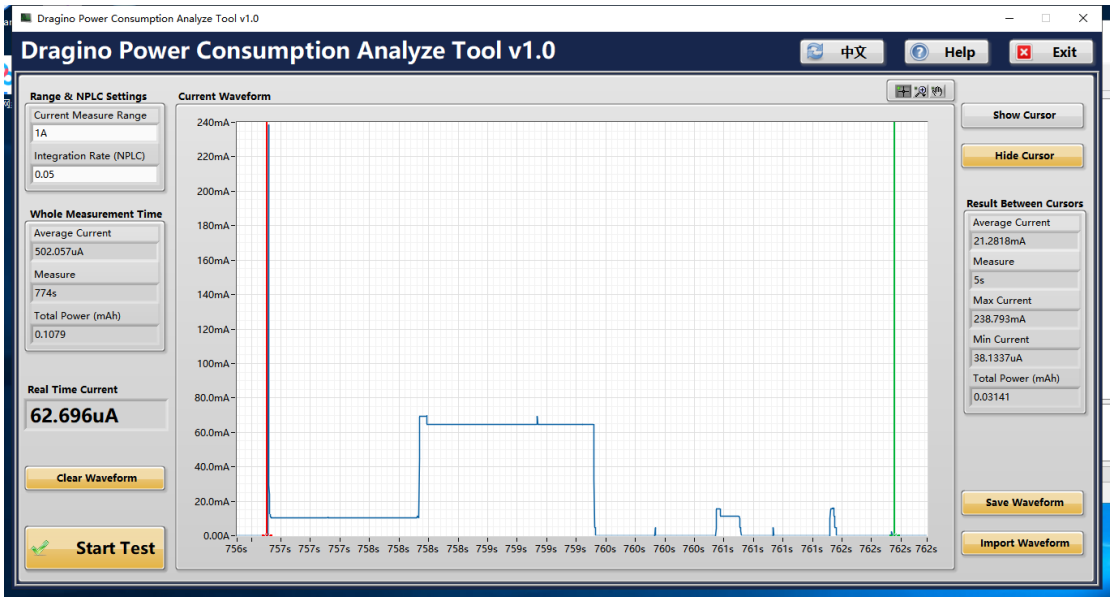
send data

Transmit Time: 5s

Average Current in transmit time: 21.2818mA

The total current to send a packet is

21.2818mA * 5s =106.409mA*s



Analyze Result

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

For example, if we install the sensor node where the DR=0, Transmit one uplink every 20 minutes .

The average current for the end node composed of:

- ✓ Deep Sleep Mode Power Consumption in one period : 0.012mA *20*60s=(14.4mA*s)
- ✓ Watch Dog Current Power Consumption in one period: 0.000791s*8.631mA*(20*60s/18 s)=(0.4551mA*s)
- ✓ Alarm Power Consumption in one period: 9.0405mA*0.017s*(20*60s/60s)=(3.0738mA*s)
- ✓ Sampling & Uplink & Downlink Power Consumption Power Consumption in one period:106.409mA*s

AV_Current is :(14.4mA*s + 0.4551mA*s + 106.409mA*s+3.0738mA*s)/(20*60s)= 0.1036mA.

The battery used in LSN50V2-D20 is 8500mAh 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

8500(1 - 2%*y) =0.1036mA * 24 * 365 * y

So 8500 – 170*y = AV_CURRENT * 8760 *y

So8500=(AV_CURRENT * 8760 +170) * Y

So Y = 8500/ (AV_CURRENT * 8760+170) = 8500/ (0.1036* 8760+170) = 7.8(Years)

1. 4. 2. DR=5,TXP=0

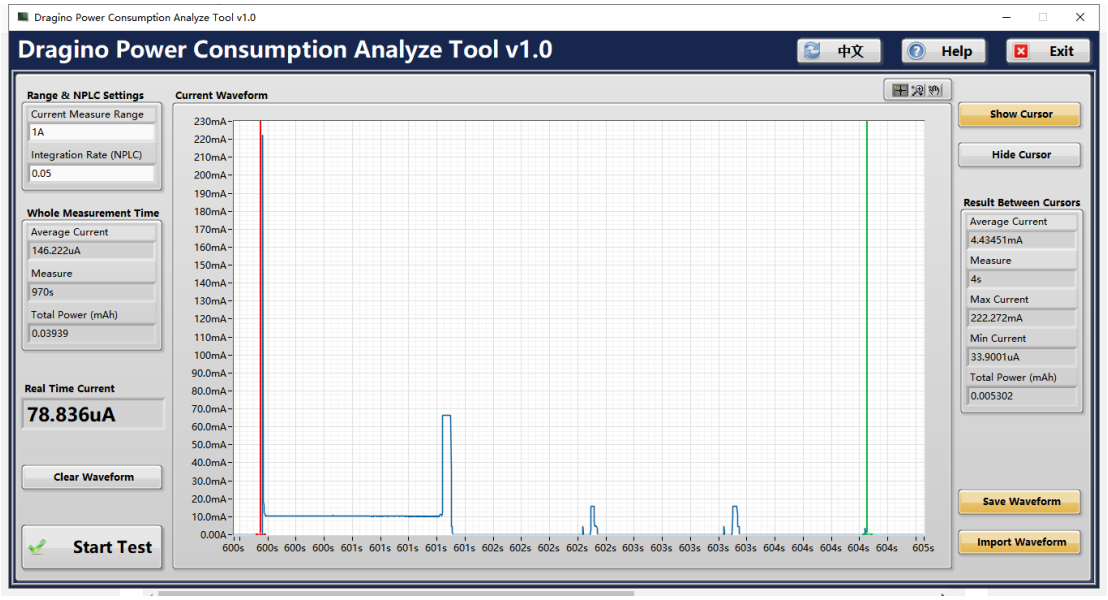
send data

Transmit Time: 4s

Average Current in transmit time: 4.4345mA

The total current to send a packet is

4.4345mA * 4s =17.738mA*s



Analyze Result

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

For example, if we install the sensor node where the DR=5, Transmit one uplink every 20 minutes .

The average current for the end node composed of:

- ✓ Deep Sleep Mode Power Consumption in one period : 0.012mA *20*60s=(14.4mA*s)
- ✓ Watch Dog Current Power Consumption in one period: 0.000791s*8.631mA*(20*60s/18 s)=(0.4551mA*s)
- ✓ Alarm Power Consumption in one period: 9.0405mA*0.017s*(20*60s/60s)=(3.0738mA*s)
- ✓ Sampling & Uplink & Downlink Power Consumption Power Consumption in one period:17.738mA*s

AV_Current is :(14.4mA*s + 0.4551mA*s + 17.738mA*s+3.0738mA*s)/(20*60s)= 0.0297mA.

The battery used in LSN50V2-D20 is 8500mAh 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

8500(1 - 2%*y) =0.0297mA * 24 * 365 * y

So 8500 – 170*y = AV_CURRENT * 8760 *y

So8500=(AV_CURRENT * 8760 +170) * Y

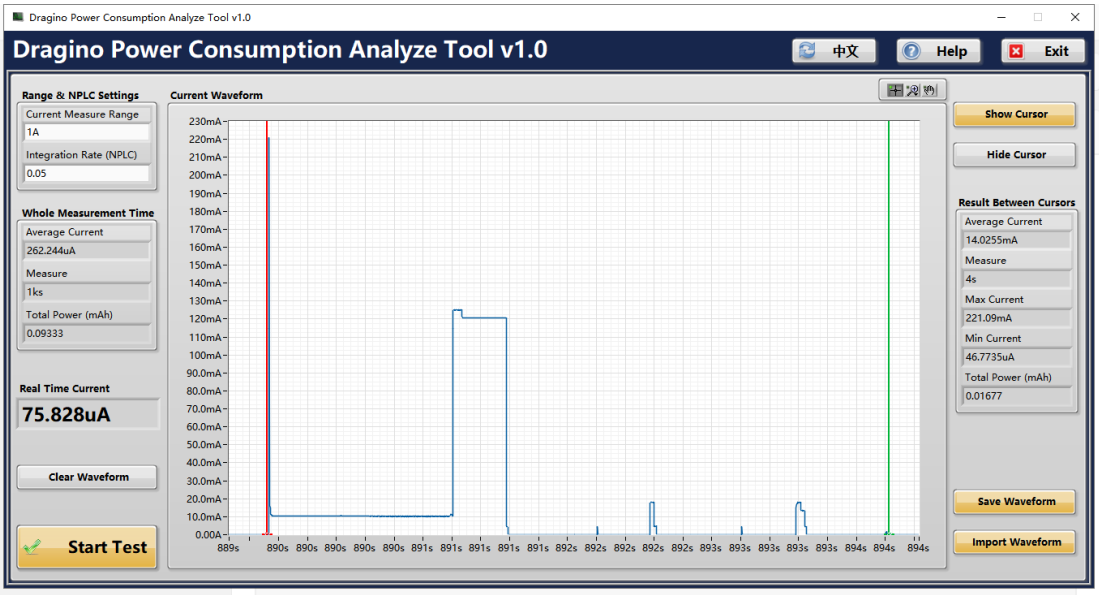
So Y = 8500/ (AV_CURRENT * 8760+170) = 8500/ (0.0297* 8760+170) = 19.7(Years)

1.5. US915

1.5.1. DR=0,TXP=0

send data
Transmit Time: 4s
Average Current in transmit time: 14.0255mA
The total current to send a packet is

14.0255mA * 4s =56.102mA*s



Analyze Result
With Above test result and battery info, we can estimate the battery life.
For example, if we install the sensor node where the DR=0, Transmit one uplink every 20 minutes .
The average current for the end node composed of:

- ✓ Deep Sleep Mode Power Consumption in one period : 0.012mA *20*60s=(14.4mA*s)
- ✓ Watch Dog Current Power Consumption in one period: 0.000791s*8.631mA*(20*60s/18 s)=(0.4551mA*s)
- ✓ Alarm Power Consumption in one period: 9.0405mA*0.017s*(20*60s/60s)=(3.0738mA*s)
- ✓ Sampling & Uplink & Downlink Power Consumption Power Consumption in one

period:56.102mA*s

AV_Current is :(14.4mA*s + 0.4551mA*s + 56.102mA*s+3.0738mA*s)/(20*60s)= 0.0617mA.

The battery used in LSN50V2-D20 is 8500mAh 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

8500(1 - 2%*y) =0.0617mA * 24 * 365 * y

So 8500 – 170*y = **AV_CURRENT** * 8760 *y

So8500=(**AV_CURRENT** * 8760 +170) * Y

So Y = 8500/ (**AV_CURRENT** * 8760+170) = 8500/ (0.0617* 8760+170) = 11.9(Years)

1.5.2. DR=3,TXP=0

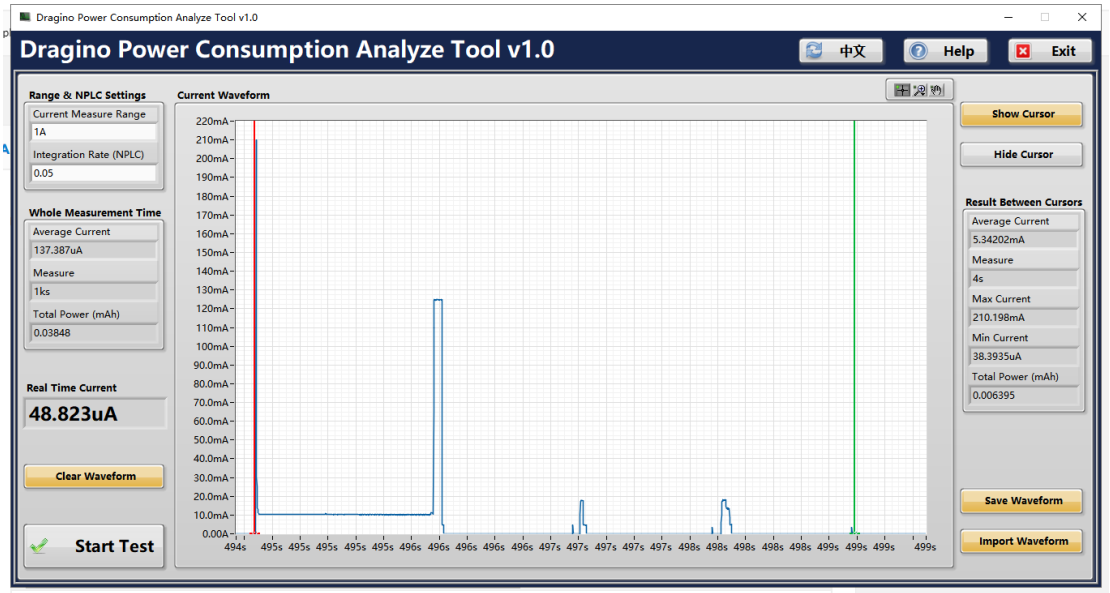
send data

Transmit Time: 4s

Average Current in transmit time: 5.342mA

The total current to send a packet is

5.342mA * 4s =21.368mA*s



Analyze Result

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

For example, if we install the sensor node where the DR=3, Transmit one uplink every 20 minutes .

The average current for the end node composed of:

- ✓ Deep Sleep Mode Power Consumption in one period : 0.012mA *20*60s=(14.4mA*s)
- ✓ Watch Dog Current Power Consumption in one period: 0.000791s*8.631mA*(20*60s/18 s)=(0.4551mA*s)
- ✓ Alarm Power Consumption in one period: 9.0405mA*0.017s*(20*60s/60s)=(3.0738mA*s)
- ✓ Sampling & Uplink & Downlink Power Consumption Power Consumption in one period:21.368mA*s

AV_Current is :(14.4mA*s + 0.4551mA*s + 21.368mA*s+3.0738mA*s)/(20*60s)= 0.0327mA.

The battery used in LSN50V2-D20 is 8500mAh 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

8500(1 - 2%*y) =0.0327mA * 24 * 365 * y

So 8500 – 170*y = AV_CURRENT * 8760 *y

So8500=(AV_CURRENT * 8760 +170) * Y

So Y = 8500/ (AV_CURRENT * 8760+170) = 8500/ (0.0327* 8760+170) = 18.6Years)