EV306

Userguide of

LoRa/LoRaWAN

Evaluation Board

Specification Version 1.1

目录

1. Introduction

1.1 Overview

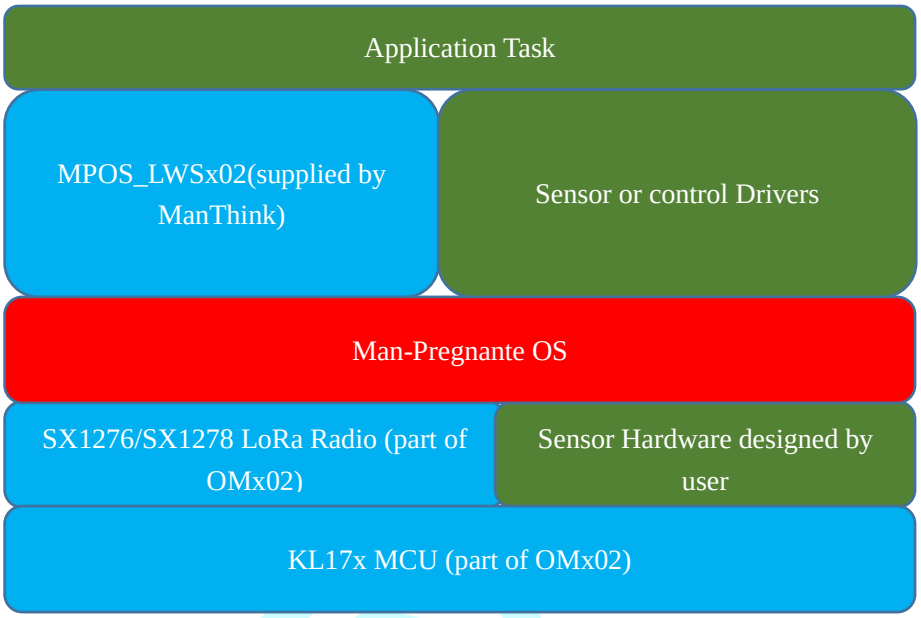
EV306 is an evaluation board for OMx02, which can help developer test the performance of OMx02 and realize the sensor application based on OMx02 and MPOS.

There are Temperature sensor(DS18B20),Humidity sensor(SHT20) ,3 axis sensor and GPS on EV306. All of the sensors on the board use IIC,UART and GPIO, by the design of double needle, EV306 open all of the hardware resource for developer.

ManThink supply the reference codes for EV306 and devleloper can get codes from github.Before using the reference codes, developer should read the document of OMx02's userguide and LoRaWAN spec.

Some underlying driver and hardware control are also necessary for the LoRaWAN application development except for the MPOS_LWSx02 supplied by ManThink. All the other drivers and codes would not be included in this document and supported by ManThink.

1.2 Architechture



1.3. Necessary

Before the development, Developer should prepare the content list below.

1.3.1 EWARM8.20

Reference codes is ran on EWARM8.20, Please prepare the EWARM8.20.

1.3.2 JlinkV8.0

Please prepare the JlinkV8.0 which can support MKL17x, the interface of debug is designed with 10 needles,

1.3.3 EV306 codes

Please download the reference codes and latest SDK from github.

1.3.4 Driver of CP210x

EV306 virtual the UART1 to a USB device, please you operate the UART1, please install the driver of CP210x first.

1.3.5 LoRaWAN gateway

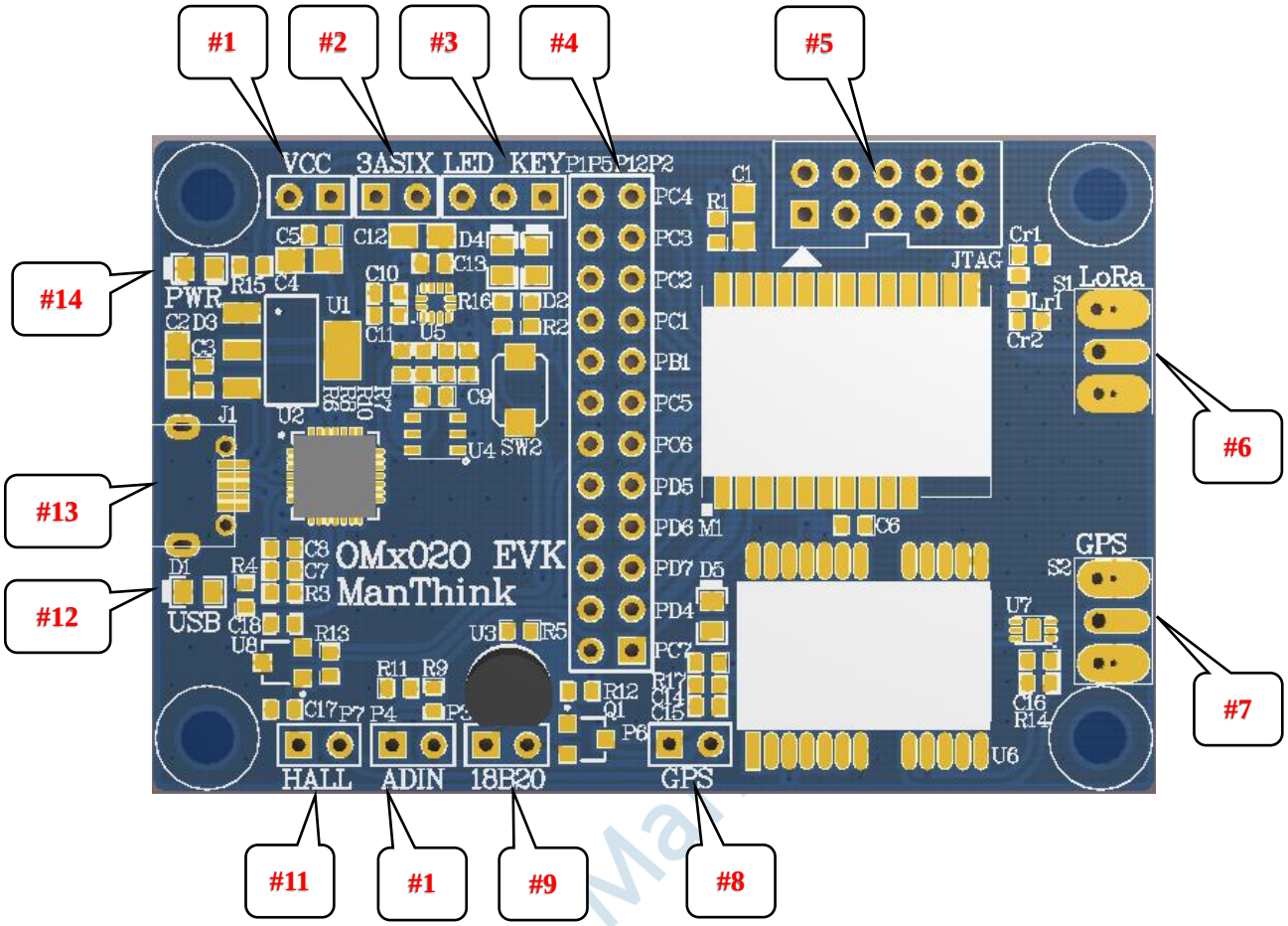
Gateway is needed in LoRaWAN system, developer should get a gateway which can connect to LoRaWAN Server before the development. Please contact ManThink to get gateway.

1.3.6 CServerDemo

If developer select ManThink's LoRaWAN Server to complete the R&D, CServerDemo is needed for the test on EV306.

2.Interface of Hardware

2.1 Definition picture



2.2 Forbidden resource

Some resource of OMx02 have already been used by the stack which is forbidden for developer. Using the forbidden resource which are listed below will cause unknown issues.

- PA1 , PA2 , PA4
- PB0

- PC5,PC6
- PE0,PE1,PE16,PE17,PE18,PE19
- SPI0 , PIT , LPTIM

2.3 Description of Hardware interface

2.3.1 #1 interface

#1：A switch for VCC. The system is powered by microUSB, by the two-pin plug to power the EV306. Developer can connect a multimeter on #1 to test the power consumption of EV306.

2.3.2 #2 interface

#2：Switch of 3 axis(LIS2DH12）and Humidity sensor（SHT20）.Developer can power the sensors by two-pin plug.

2.3.3 #3 interface

#3：Option switch for LED and key. If the two-pin plug in the side of LED, the LED's pin will connect to OMx02, otherwise. The KEY's pin will connect to OMx02.s

2.3.4 #4 interface

#4： the left pin of the double needles is used to connect the specific sensors and the right pins connect to OMx02. Two-pin plug can realize the connection to sensors or opened for developer.

Details definition：

PC4:UART1_TX, TXD pin of UART1， can connect to MicroUSB by two-pin plug

PC3: UART1_RX,RXD pin of UART1， can connect to MicroUSB by two-pin plug

PC2: I2C1_SDA, can connect to STH20 和 LIS2DH12

PC1:I2C1_SCL, can connect to STH20 和 LIS2DH12

PB1: pin PB1 of OMx02，can connect to LED(D2);

PC5:pin PC5 of OMx02，can connect to LED(D4) or Key;

PC6:pin PC6 of OMx02，can connect to YS4915's output pin;

PD5: UART2_TX, TX pin of UART2，can connect to GPS;

PD6: pin PD6 of OMx02，can connect to the base of triode to control the power supply for GPS.

PD7: UART2_RX, RX pin of UART2，can connect to GPS.

PD4: pin PD4 of OMx02, can connect to the two resistances of EV306 for ADC's test.

PC7: pin PC7 of OMx02，can connect to DS18B20

2.3.5 #5 interface

#5：connector of JTAG，please debug your codes with SWID

2.3.6 #6 interface

#6：interface of LoRa's antenna

2.3.7 #7 interface

#7：GPS's antenna. Please select the antenna without power supply.

2.3.8 #8 interface

#8：Power supply for GPS, developer can power GPS by two-pin plug. Developer can select two-pin plug or triode to power GPS module.

2.3.9 #9 interface

#9: power switch for DS18B20

2.3.10 #10 interface

#10: power switch for ADC test.

2.3.11 #11 interface

#11: Power switch for magnetic sensor

2.3.12 #12 interface

#12: interface for USB, if the UART interface is opened by PC side, the led will be lighted.

2.3.13 #13 interface

#13: Micro USB used for power and communication.

2.3.14 #14 interface

#14: LED for VCC power supply.

2.4 SDK version

	version	Hardware supported	Function	
1	MPOS_LWS402lite	OM402,OM402S	MPOS,ClassA,ClassC, SW modes 410-510MHz	
2	MPOS_LWS802lite	OM802,OM802S	MPOS,ClassA,ClassC, SW mode 860-1020MHz	
3	MPOS_LWS402	OM402S	MPOS,ClassA,ClassB，ClassC SW mode，broadcast，FUOTA， multi-bin ,410-510MHz	
4	MPOS_LWS802	OM802S	MPOS,ClassA,ClassB,ClassC, SW mode，broadcast，FUOTA， multi-bin 860-1020MHz	
5	MPOS_LWS411	OM411	MPOS,ClassA,ClassB，ClassC SW mode，broadcast，FUOTA， multi-bin ,410-510MHz	
6	MPOS_LWS811	OM811	MPOS,ClassA,ClassB,ClassC, SW mode，broadcast，FUOTA， multi-bin 860-1020MHz	

3. EV306_SENSOR

EV306_SENSOR is the reference code based on EV306 provided by ManThink.It can realize the application example of SHT20 , Key , LED,3-axis sensor,DS18B20,magnetic switch and so on. User can download the reference code from GitHub.

If the project EV306_SENSOR is running on EV306, we need to connect terminal as follow: #1,#2,#3 as the KEY side，#4(PC4、PC3 、PC2、PC1、PB1、PC5 and PC7 need to be connected),#9。

4. Debug

4.1 Necessary software and driver

4.1.1 Driver for Jlink

Please download by yourself.

4.1.2IAR for ARM 8.20.2 or higher

Please download by yourself.

4.2 Operation

4.2.1 Connection like picture below

4.2.2 download codes from github

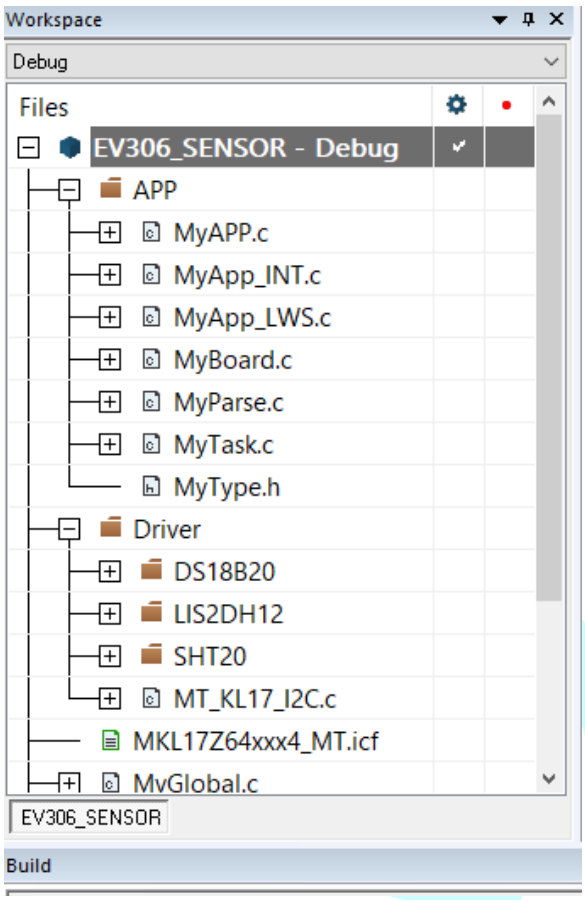
https://github.com/ManThinkMPOS/MPSD.git

4.2.3 download software driver and datasheet on cloud

https://www.jianguoyun.com/p/DUNcJgMQlqyUBxitz4AB

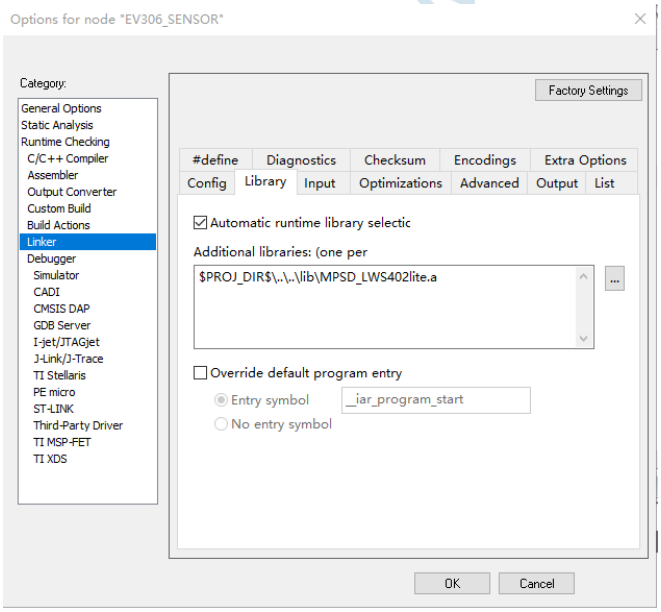
Password: 0d9d7u

4.2.4 Open the workspcace files



4.2.5 parameters of Project

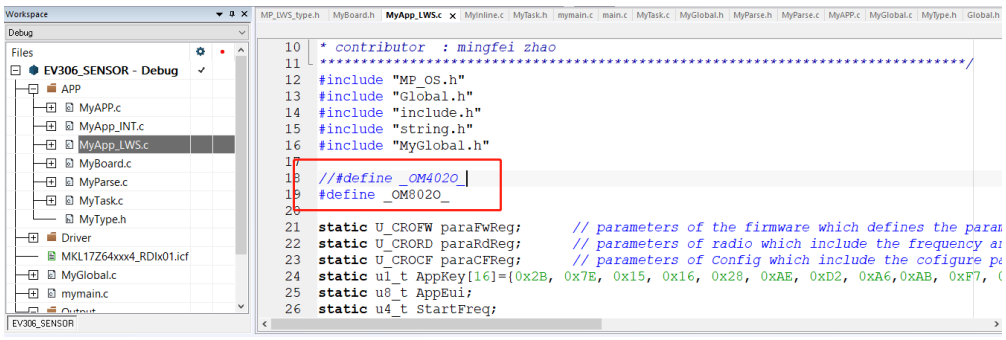
1) Way to change the SDK



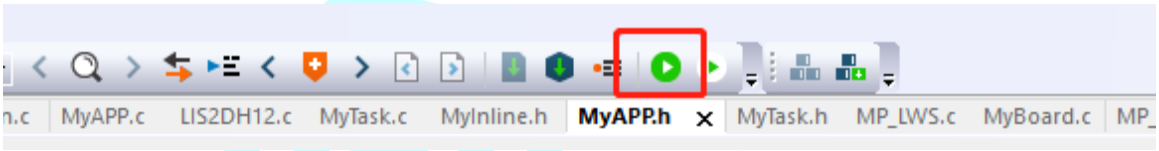
2) If the module is OM802/OM802S Please follow steps below

*Commented out _OM402O_, enable _OM802O_*

NOTE: ignore the steps if OM402/OM402S

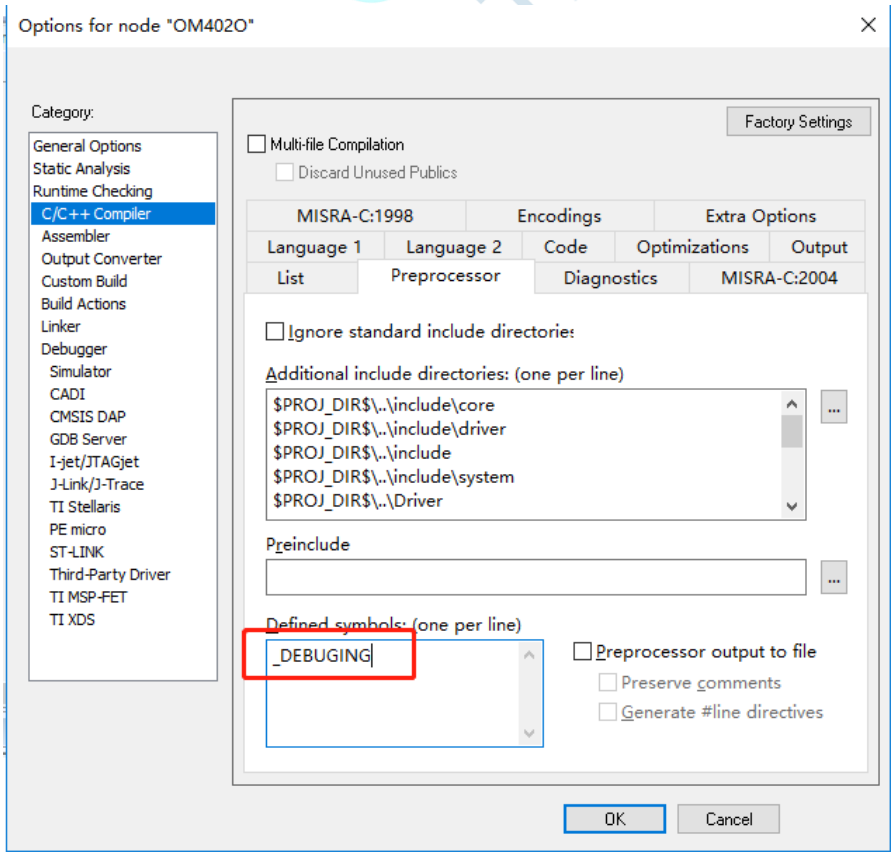


3) Click download and debug



4) If developer want to debug codes, Please add the definition of _DEBUGING

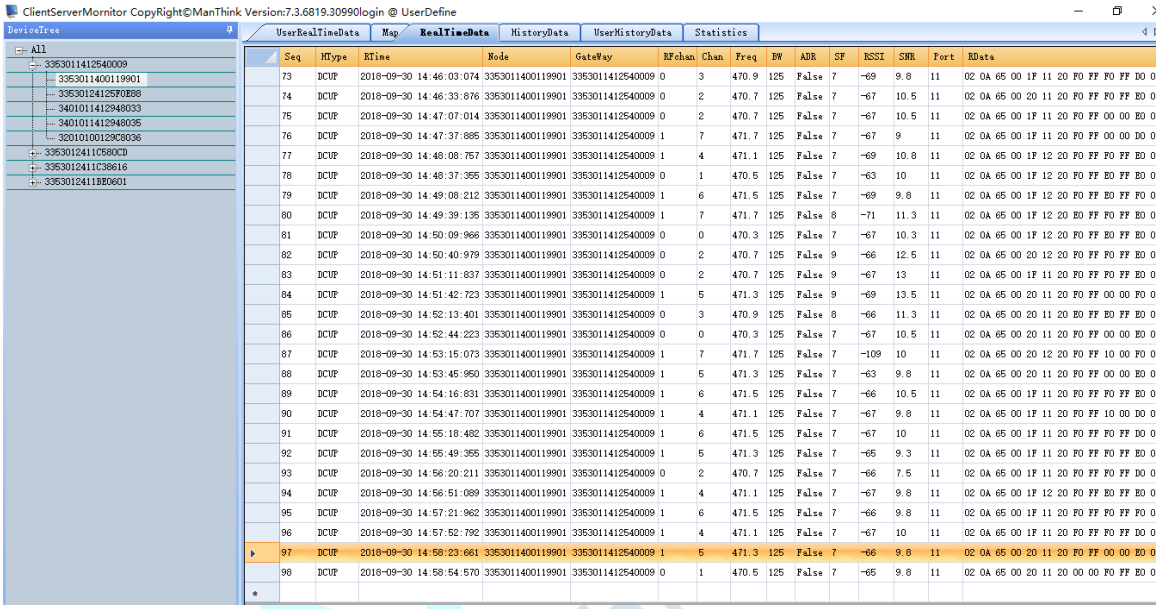
If want to low-power running, please delete the definition of _DEBUGING



5) Reference codes transmit a packet every 30s，Developer can get the data from CserverDemo.

6) Please install the software of CServerV6.2_X64Setup.exe

7) Please read the user guide of CServerDemo at first

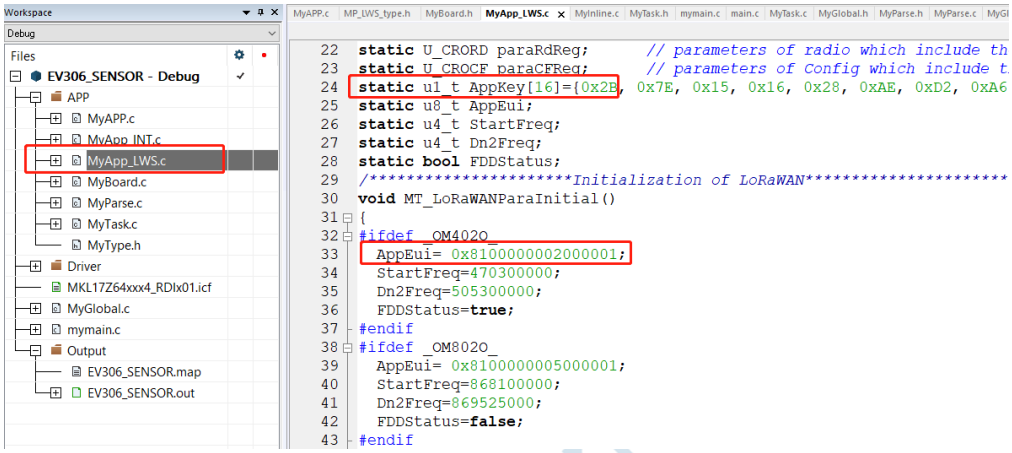


Seq	MType	RTime	Node	GateWay	RFchan	Chan	Freq	BW	ADR	SF	RSSI	SNR	Port	RData
73	DCUP	2018-09-30 14:46:03:074	3353011400119901	3353011412540009	0	3	470.9	125	False	7	-69	9.8	11	02 0A 65 00 1F 11 20 F0 FF F0 FF D0 0
74	DCUP	2018-09-30 14:46:33:876	3353011400119901	3353011412540009	0	2	470.7	125	False	7	-67	10.5	11	02 0A 65 00 20 11 20 F0 FF F0 FF E0 0
75	DCUP	2018-09-30 14:47:07:014	3353011400119901	3353011412540009	0	2	470.7	125	False	7	-67	10.5	11	02 0A 65 00 1F 11 20 F0 FF 00 00 E0 0
76	DCUP	2018-09-30 14:47:37:885	3353011400119901	3353011412540009	1	7	471.7	125	False	7	-67	9	11	02 0A 65 00 1F 11 20 F0 FF 00 00 D0 0
77	DCUP	2018-09-30 14:48:08:757	3353011400119901	3353011412540009	1	4	471.1	125	False	7	-69	10.8	11	02 0A 65 00 1F 12 20 F0 FF F0 FF E0 0
78	DCUP	2018-09-30 14:48:37:365	3353011400119901	3353011412540009	0	1	470.5	125	False	7	-63	10	11	02 0A 65 00 1F 12 20 F0 FF E0 FF E0 0
79	DCUP	2018-09-30 14:49:08:212	3353011400119901	3353011412540009	1	6	471.5	125	False	7	-69	9.8	11	02 0A 65 00 1F 12 20 F0 FF E0 FF F0 0
80	DCUP	2018-09-30 14:49:39:135	3353011400119901	3353011412540009	1	7	471.7	125	False	8	-71	11.3	11	02 0A 65 00 1F 12 20 E0 FF F0 FF E0 0
81	DCUP	2018-09-30 14:50:09:966	3353011400119901	3353011412540009	0	0	470.3	125	False	7	-67	10.3	11	02 0A 65 00 1F 12 20 F0 FF E0 FF E0 0
82	DCUP	2018-09-30 14:50:40:979	3353011400119901	3353011412540009	0	2	470.7	125	False	9	-66	12.5	11	02 0A 65 00 20 12 20 F0 FF F0 FF E0 0
83	DCUP	2018-09-30 14:51:11:837	3353011400119901	3353011412540009	0	2	470.7	125	False	9	-67	13	11	02 0A 65 00 1F 11 20 F0 FF F0 FF E0 0
84	DCUP	2018-09-30 14:51:42:723	3353011400119901	3353011412540009	1	5	471.3	125	False	9	-69	13.5	11	02 0A 65 00 20 11 20 F0 FF 00 00 F0 0
85	DCUP	2018-09-30 14:52:13:401	3353011400119901	3353011412540009	0	3	470.9	125	False	8	-66	11.3	11	02 0A 65 00 20 11 20 E0 FF E0 FF E0 0
86	DCUP	2018-09-30 14:52:44:223	3353011400119901	3353011412540009	0	0	470.3	125	False	7	-67	10.5	11	02 0A 65 00 20 11 20 F0 FF 00 00 E0 0
87	DCUP	2018-09-30 14:53:15:073	3353011400119901	3353011412540009	1	7	471.7	125	False	7	-109	10	11	02 0A 65 00 20 12 20 F0 FF 10 00 F0 0
88	DCUP	2018-09-30 14:53:45:950	3353011400119901	3353011412540009	1	5	471.3	125	False	7	-63	9.8	11	02 0A 65 00 20 11 20 F0 FF 00 00 E0 0
89	DCUP	2018-09-30 14:54:16:831	3353011400119901	3353011412540009	1	6	471.5	125	False	7	-66	10.5	11	02 0A 65 00 1F 11 20 F0 FF F0 FF E0 0
90	DCUP	2018-09-30 14:54:47:707	3353011400119901	3353011412540009	1	4	471.1	125	False	7	-67	9.8	11	02 0A 65 00 1F 11 20 F0 FF 10 00 D0 0
91	DCUP	2018-09-30 14:55:18:482	3353011400119901	3353011412540009	1	6	471.5	125	False	7	-67	10	11	02 0A 65 00 1F 11 20 F0 FF F0 FF D0 0
92	DCUP	2018-09-30 14:55:49:355	3353011400119901	3353011412540009	1	5	471.3	125	False	7	-65	9.3	11	02 0A 65 00 1F 11 20 F0 FF F0 FF E0 0
93	DCUP	2018-09-30 14:56:20:211	3353011400119901	3353011412540009	0	2	470.7	125	False	7	-66	7.5	11	02 0A 65 00 1F 11 20 F0 FF F0 FF D0 0
94	DCUP	2018-09-30 14:56:51:089	3353011400119901	3353011412540009	1	4	471.1	125	False	7	-67	9.8	11	02 0A 65 00 1F 12 20 F0 FF E0 FF E0 0
95	DCUP	2018-09-30 14:57:21:962	3353011400119901	3353011412540009	1	6	471.5	125	False	7	-66	9.8	11	02 0A 65 00 1F 11 20 F0 FF F0 FF F0 0
96	DCUP	2018-09-30 14:57:52:792	3353011400119901	3353011412540009	1	4	471.1	125	False	7	-67	10	11	02 0A 65 00 1F 11 20 F0 FF F0 FF D0 0
97	DCUP	2018-09-30 14:58:23:661	3353011400119901	3353011412540009	1	5	471.3	125	False	7	-66	9.8	11	02 0A 65 00 20 11 20 F0 FF 00 00 E0 0
98	DCUP	2018-09-30 14:58:54:570	3353011400119901	3353011412540009	0	1	470.5	125	False	7	-65	9.8	11	02 0A 65 00 20 11 20 00 00 F0 FF E0 0

5. Operation of Join reset

5.1 modify the parameters

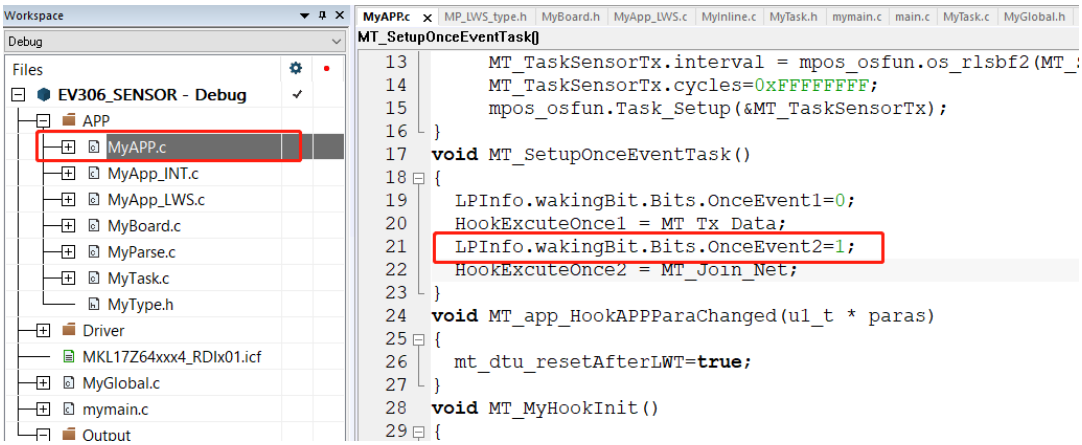
If developer want to join other LoRaWAN network besides of ManThink, Developer should get the parameters of APPEUI, APPKey from the LoRaWAN network operator.



5.2 Join the network by One-off task

ManThink supply a way to join the network by One-off task. MPOS is very powerful to realize different way to join the network.

If enable the event, Module will start joining at the reset every time.



6. Contact

Please contact us for more supports and details.

ManThink Technology Co., Ltd

Web： www.manthink.cn

BBS : www.loramaker.com

E-mail： info@manthink.cn

Tel： +86-10-5622 9170

Add： Room601 Ronghua International Building No.5, Ronghua South Road

No.10, E-town, Beijing, P.R.China