



JetWave 4110L
Industrial Lora Gateway
User Manual

V1.2 Dec. 2019

LoRa

- Program Tool
- USB Driver
- Installation Guid.txt

1. Install USB Driver.

- 1.1 CP210xVCPInstaller_x86.exe: For Windows XP、Vista、win7 32bits.
- 1.2 CP210xVCPInstaller_x64.exe: For Windows Vista、Win7、Win8 64bits.

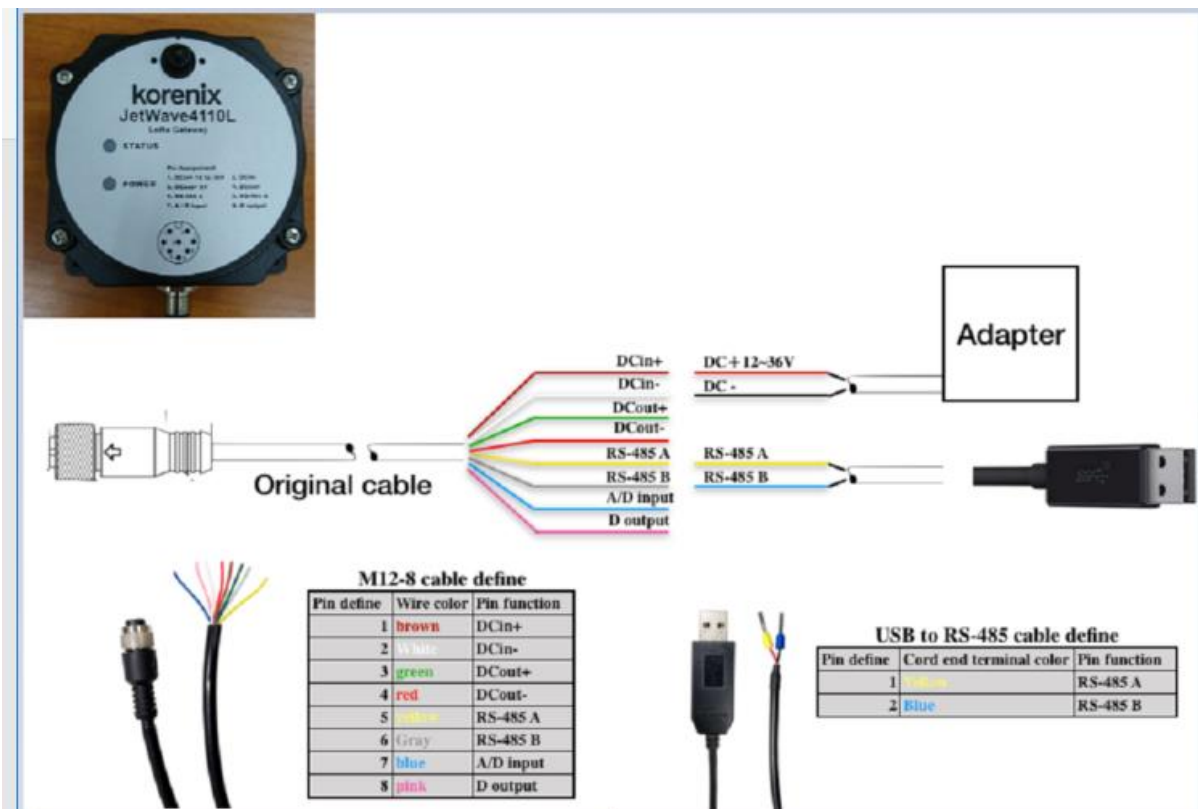
2. Copy all files in the "Program Tool" folder in your PC. (WW_BOX_LoRa.exe / SLABHIDDevice.dll / SLABHIDtoUART.dll).

3. Connect the LORA product and execute the Program Tool (WW_BOX_LoRa.exe).

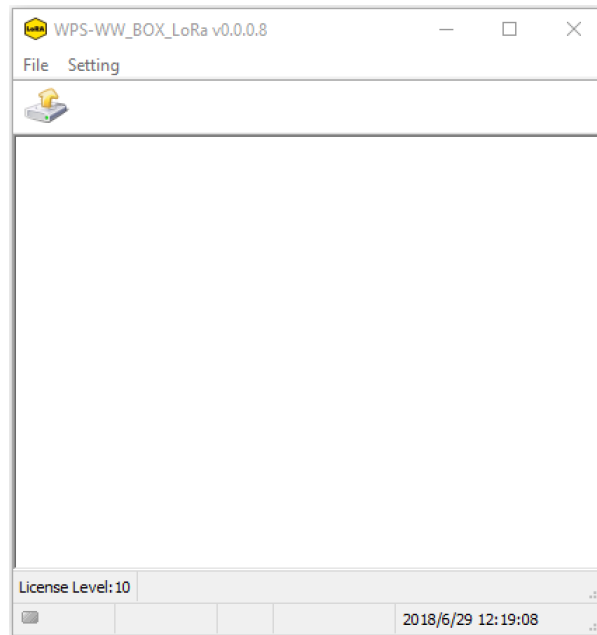
Noted that:

1. Requires operating system: Windows XP / Vista / 7 / 8 / 10.
2. The software supports the Wireless LoRa RS-485 Gateway

Connect the PC for settings diagram



Program Tool (WW_BOX_LoRa.exe)



Icon Introduction



Read setting from device



Write setting to device



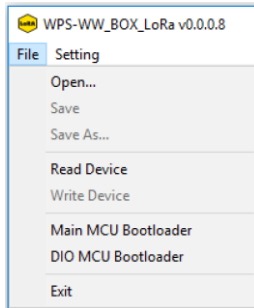
Back to All setting list



Continuous writing device from setting parameter file(*.par)

MENU Introduction

File Menu



Open... Open a setting parameter file (*.par)

Save Save the setting parameter file

Save As... Save all settings as another parameter file

Read Device Read setting from device

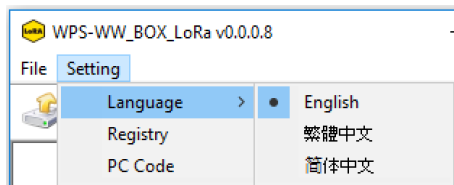
Write Device Write all settings to device

Main MCU Bootloader Main MCU entry to Firmware Update Mode

DIO MCU Bootloader DIO board MCU entry to Firmware Update Mode

Exit Exit the program

Setting Menu




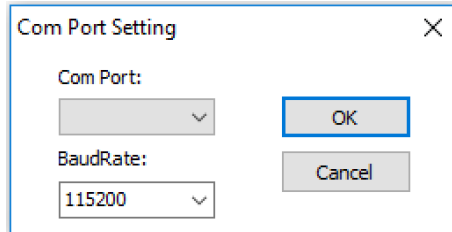
Language Select the language, such as English\繁體中文\简体中文

Registry Factory functions enable registration code

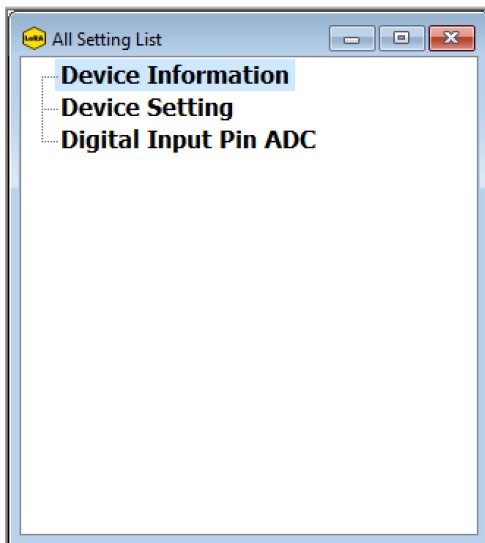
PC Code Install PC hardware ID

Execute WW_BOX_LoRa.exe

Press  Read setting from device and select the correct COM port and BaudRate(You can ignore BaudRate and the system will automatically search for you).

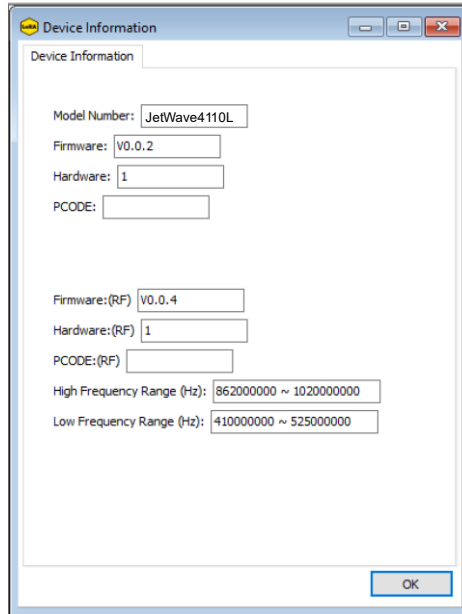


1. Read setting list from device as below.



All Setting List

Device Information



The screenshot shows a window titled "Device Information" with the following fields:

- Model Number: JetWave4110L
- Firmware: V0.0.2
- Hardware: 1
- PCODE: (empty)
- Firmware:(RF): V0.0.4
- Hardware:(RF): 1
- PCODE:(RF): (empty)
- High Frequency Range (Hz): 862000000 ~ 1020000000
- Low Frequency Range (Hz): 410000000 ~ 525000000

An "OK" button is located at the bottom right of the window.

All device information is shown on on the Device Information page.

Model Number This item is product model number

Firmware Main Firmware Version

Hardware Main Hardware Version

PCODE Product CODE for factory use

Firmware (RF) RF Firmware Version

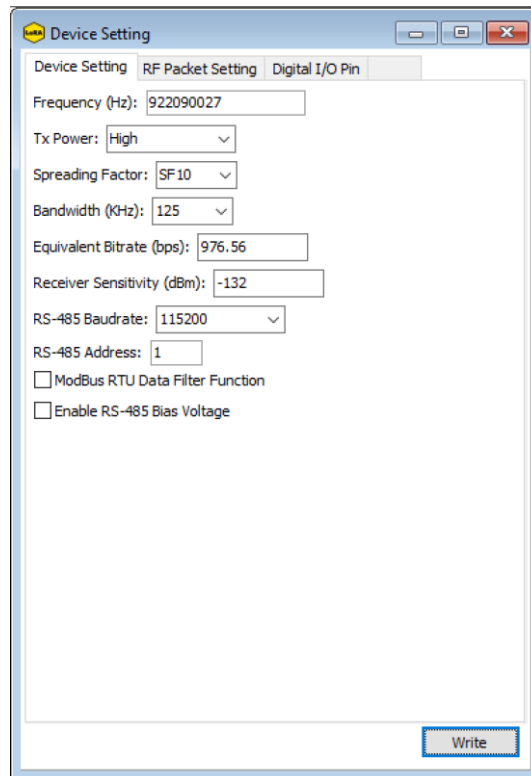
Hardware (RF) RF Hardware Version

PCODE (RF) RF Product CODE for factory use

High Frequency Range (Hz) High band range 862~1020MHz*

Low Frequency Range (Hz) Low band range 410~525MHz*

(*): Will be adjusted according to national regulations.



※Noted that:

All devices are identical in the setting of frequency and RF BitRate.

All device settings are shown on as follows.

Frequency (Hz)

Setting transmit and receive frequency, the frequency range is 410MHz to 525MHz / 862MHz to 1020MHz.

Tx Power

Setting transmit power High (2W), Middle (1W), Low (0.5W).

Spreading Factor

Setting spreading factor, the range is 7~12. The smaller the value, the greater the transmission rate. **

Bandwidth (KHz)

Setting bandwidth, the range is 7.8~500 kHz. **

Equivalent Bitrate (bps)

Display equivalent bitrate, for reference only. This value will change according to the Spreading Factor and Bandwidth.

Receiver Sensitivity (dBm)

Display receiver sensitivity, for reference only. This value will change according to the Spreading Factor

and Bandwidth.

RS-485 / RS-232 Baudrate (bps)

The Baudrate setting from 4800, 9600, 19200, 38400, 57600, 115200, 230400.

RS-485 Address

Setting the RS-485 device address(1~255).

Modbus RTU Data Filter Function

Check the box to enable Modbus RTU data filter function. This function will be checked the RS-485 address and Modbus RTU checksum.

If this function is enabled, the data input from the RF(LoRa)/ RS-485/RS-232 will be compared with RS-485 Address and Modbus RTU Data CheckSum.

Enable RS-485 Bias Voltage

Check the box to enable RS-485 Bias Voltage function. RS-485 bias voltage will provided by JetWave 4110L.

(**):Adjusting Spreading Factor and Bandwidth will affect Bitrate and Sensitivity. Bitrate range is .018 - 37.5 kbps and Sensitivity range is -111 to -148 dBm.

RF Packet Setting

The screenshot shows a software window titled "Device Setting" with three tabs: "Device Setting", "RF Packet Setting", and "Digital I/O Pin". The "RF Packet Setting" tab is active. It contains two main sections: "Receive Packet" and "Transmit Packet".

Receive Packet:

- Address base filtering: Broadcast / Node / Group (dropdown menu)
- Node address: 1 (text input)
- Group address: 128 (text input)

Transmit Packet:

- Target Address Type: Broadcast (dropdown menu)
- Node address: 1 (text input)
- Group address: 128 (text input)

Packet Verify Code(Hex.): 0x 79 (text input)

A "Write" button is located at the bottom right of the window.

※Noted that:

All devices are identical in the Sync. word value to link.

Receive Packet Setting

Address base filtering

Broadcast / Node / Group, Broadcast / Node, Broadcast / Group, Node / Group,
Broadcast only, Node only, Group only

Node address 1~255 ※Own Address

Group address 1~255 ※Own Address

Transmit Packet Setting

Target address Type Broadcast, Node, Group

Node address 1~255 ※Node address of the destination (receiver)

Group address 1~255 ※Group address of the destination (receiver)

Pattern association

RX \ TX	Broadcast	Node	Group
Broadcast / Node / Group	YES	YES	YES
Broadcast / Node	YES	YES	NO
Broadcast / Group	YES	NO	YES
Node / Group	NO	YES	YES
Broadcast only	YES	NO	NO
Node only	NO	YES	NO
Group only	NO	NO	YES

【YES】 The device receive is available.

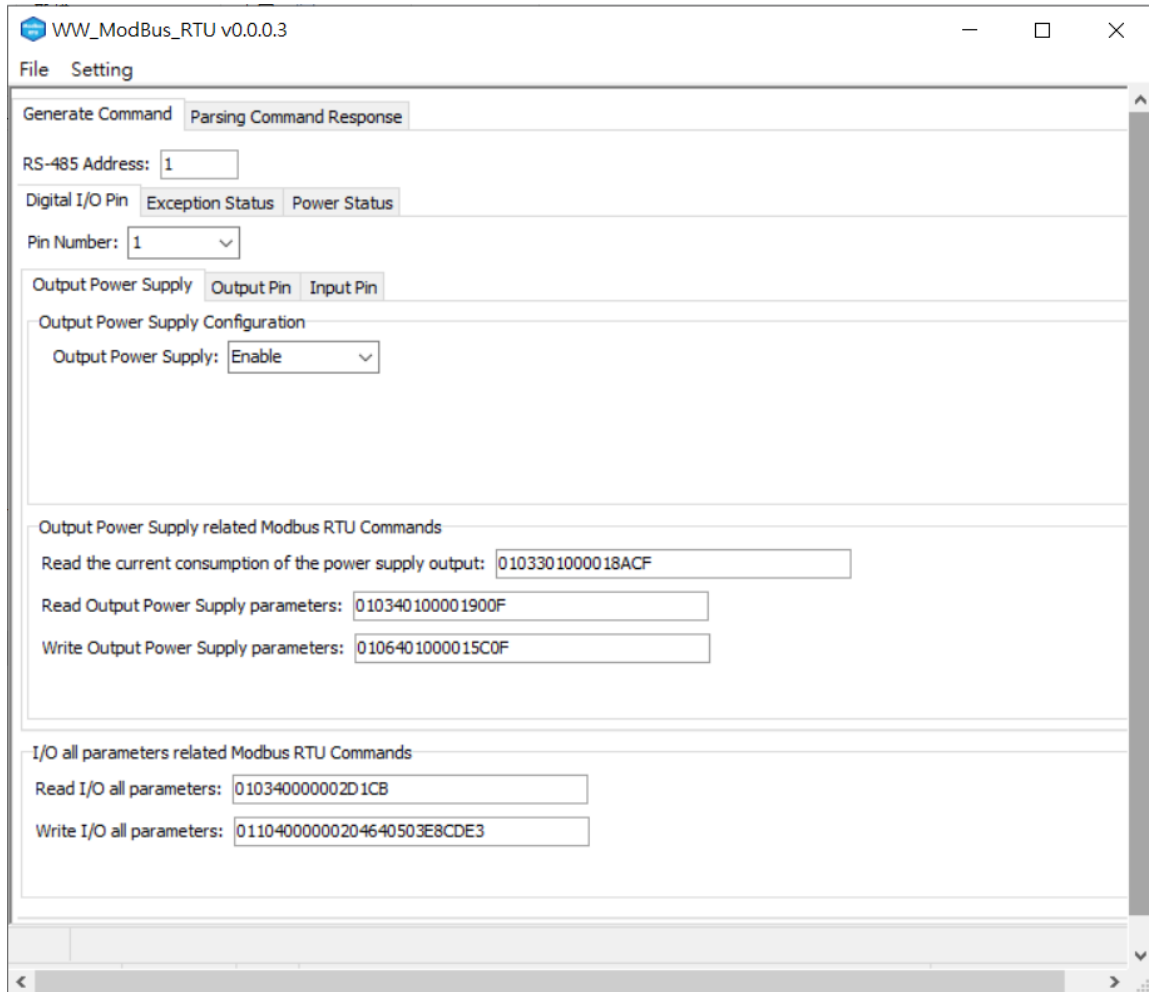
【NO】 The device receive is invalid.

Packet verify Code(.Hex)

Set this value to confirm the packet, only packets that match the value will be received.

ModBus RTU generator tool

Install “WW_ModBus_RTU” tool. For more ModBus generator tool.



Install "WW_P_CMD_Tool" tool. For more string generator tool.

WW_P_CMD_Tool v0.0.0.3

File Setting

Generate Command Parsing Command Response

Receiving side RS-485 Address: Sending side RS-485 Address: ***All commands must end with "\r\n" (0x0D, 0x0A)!**

Digital I/O Pin

Pin Number:

Output Power Supply Output Pin Input Pin

Output Power Supply Configuration

Output Power Supply:

Auto Report setting

Report Target RS-485 ID: Report Path:

Timed Reporting Interval (sec): (0=Disable the timed reporting function)

Threshold Detect and Report Interval (sec):

Reporting condition for each pins

Threshold Reporting Conditions:

Max. Threshold Value : . mA

Min. Threshold Value : . mA

Output Power Supply related Commands

Read the current consumption of the power supply output:

Read Output Power Supply parameters: Read Auto Report parameters:

Write Output Power Supply parameters: Write Auto Report parameters:

Read Threshold Reporting Conditions:

Write Threshold Reporting Conditions:

I/O all parameters related Commands

Read I/O all parameters:

Write I/O all parameters:

Modbus RTU format:

ID Number 1 Byte	Function Code 1 Byte	Data N Byte	CRC Code 2 Byte
---------------------	-------------------------	----------------	--------------------

ID Number:

Range : 1~255, LoRa gateway RS-485 ID

Function Code Map:

Function Code	Action Description
03 (03H)	Read multi-register parameter
06 (06H)	Set single-register parameter
16 (10H)	Set multi-register parameter

Error Message code:

Message code	Description
01(01H)	Illegal or unknow function code
02(02H)	Illegal data address
03(03H)	Illegal content or data out of range)
04(04H)	Communication failed or execution failed

Function Code description:

03(03H): Read multiple registers

Send command:

ID Number	Function Code	Register Address	Data	CRC
(1Byte)	(1Byte)	(2Bytes)	(2Bytes)	(2Bytes)
	03H		n	

Lora gateway response:

ID Number	Function Code	Data length	Data	CRC
(1Byte)	(1Byte)	(1Bytes)	(2*n Bytes)	(2Bytes)
	03H	=2*n		

Lora gateway response error message

ID Number	Function Code	Message code	CRC
(1Byte)	(1Byte)	(1Bytes)	(2Bytes)
	83H		

06(06H): Preset single-register

Send command:

ID Number	Function Code	Register Address	Data	CRC
(1Byte)	(1Byte)	(2Bytes)	(2Bytes)	(2Bytes)
	06H			

Lora gateway response:

ID Number	Function Code	Register Address	Data	CRC
(1Byte)	(1Byte)	(2Bytes)	(2*n Bytes)	(2Bytes)
	06H			

Lora gateway response error message

ID Number	Function Code	Message code	CRC
(1Byte)	(1Byte)	(1Bytes)	(2Bytes)
	86H		

16(10H): Preset multiple registers

Send command:

ID Number	Function Code	Register Address	Register Qty	Data Bytes	Data	CRC
(1Byte)	(1Byte)	(2Bytes)	(2Bytes)	(1Bytes)	(2Bytes)	(2Bytes)
	10H		n	=2*n		

Lora gateway response:

ID Number	Function Code	Register Address	Register Qty	CRC
(1Byte)	(1Byte)	(2Bytes)	(2*n Bytes)	(2Bytes)
	10H		n	

Lora gateway response error message

ID Number	Function Code	Message code	CRC
(1Byte)	(1Byte)	(1Bytes)	(2Bytes)
	90H		

Example:

03(03H)

Ex: Read DI_1 ADC value

Send command:

ID Number	Function Code	Register Address	Data	CRC
01H	03H	3000H	0001H	8B0AH

Lora gateway response: (if data result is 100)

ID Number	Function Code	Data length	Data	CRC
01H	03H	02H	2710H	A278H

Lora gateway response error message

ID Number	Function Code	Message code	CRC
01H	83H	03H	0131H

REG_DI_VAL_1: 0x3000 (16bits structure)

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
DI_Type_3	DI_Type_2	DI_Type_1	DI_Value_13	DI_Value_12	DI_Value_11	DI_Value_10	DI_Value_9	DI_Value_8	DI_Value_7	DI_Value_6	DI_Value_5	DI_Value_4	DI_Value_3	DI_Value_2	DI_Value_1

DI_Type and DI_Value description :

DI_Type	Description	DI_Value	Multiples	Range / ture value
0	0~10V / normal ADC (mV)	Unsigned integer	*2	0~5000 (0~10000mV)
1	Logic High / Low detect	Unsigned integer	*1	0,1
2	4~20mA (%)	Float *100	*2/100	0~5000 (0.00%~100.00%)
3	0~10V (%)	Float *100	*2/100	0~5000 (0.00%~100.00%)
4	4~20mA (mA)	Float *100	*1/100	400~2000 (4.00~20.00mA)
5	0~20mA (%)	Float *100	*2/100	0~5000 (0.00%~100.00%)
6	0~20mA (mA)	Float *100	*1/100	0~2000 (0.00~20.00mA)

REG_VOUT_CUR_VAL_1: 0x3010

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Vout_En	Value_15	Value_14	Value_13	Value_12	Value_11	Value_10	Value_9	Value_8	Value_7	Value_6	Value_5	Value_4	Value_3	Value_2	Value_1

Value description:

Description (unit)	Value type	Multiples	Range / ture value
Current consumption (mA)	Float *100	*1/100	0~20000 (0.00~200.00mA)

Vout_En :

Description	Value
External power supply	0: Disable 1: Enable

REG_DIO_EXCEP_STATUS: 0x3020

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	AI_4_20mA_Err_1

AI_4_20mA_Err_x	DIO x 之 4~20mA input current exception (>22mA)
*****	Reserved

REG_POWER_ELECTRICITY: 0x3021

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
Multi_2	Multi_1	Power_Elect_14	Power_Elect_13	Power_Elect_12	Power_Elect_11	Power_Elect_10	Power_Elect_9	Power_Elect_8	Power_Elect_7	Power_Elect_6	Power_Elect_5	Power_Elect_4	Power_Elect_3	Power_Elect_2	Power_Elect_1

Power_Elect	Power value (X)mV 0x0000~0x3FFF (0~16383mV)
Multi	Multiples (N) N:0x00~0x03

Actual power supply : $X*(N+1)$ mV

06(06H)

Ex: Preset DIO Vout status:

Send command:

ID Number	Function Code	Register Address	Data	CRC
01H	06H	4010H	0001H	5C0FH

Lora gateway response:

ID Number	Function Code	Data length	Data	CRC
01H	06H	4010H	0001H	5C0FH

Lora gateway response error message: (Ex: out of range)

ID Number	Function Code	Message code	CRC
01H	86H	03H	0261H

Ex: Preset DIO DI_1 status:

Send command:

ID Number	Function Code	Register Address	Data	CRC
01H	06H	4020H	0005H	5DC3H

Lora gateway response:

ID Number	Function Code	Data length	Data	CRC
01H	06H	4020H	0005H	5DC3H

Lora gateway response error message: (Ex: out of range)

ID Number	Function Code	Message code	CRC
01H	86H	03H	0261H

Ex: Preset DIO DO_1 status: (Set both of REG_DIO_DO_PAR1_1& REG_DIO_DO_PAR2_1)

REG_DIO_DO_PAR1_1:

Send command:

ID Number	Function Code	Register Address	Data	CRC
01H	06H	4030H	0191H	5C39H

Lora gateway response:

ID Number	Function Code	Data length	Data	CRC
01H	06H	4030H	0191H	5C39H

Lora gateway response error message: (Ex: out of range)

ID Number	Function Code	Message code	CRC
01H	86H	03H	0261H

REG_DIO_DO_PAR2_1:

Send command:

ID Number	Function Code	Register Address	Data	CRC
01H	06H	4031H	03E8H	CD7BH

Lora gateway response:

ID Number	Function Code	Data length	Data	CRC
01H	06H	4031H	03E8H	CD7BH

Lora gateway response error message: (Ex: out of range)

ID Number	Function Code	Message code	CRC
01H	86H	03H	0261H

REG_DIO_VOUT_PAR_1: 0x4010

REG_DIO_DI_PAR_1: 0x4020

REG_DIO_DO_PAR1_1: 0x4030

REG_DIO_DO_PAR2_1: 0x4031

REG_DIO_VOUT_PAR1

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** ***** *****	Vout_En	

Vout_En	5V/200mA(max) power output supply 0: Disable 1: Enable
---------	--

REG_DIO_DI_PAR

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
*****	*****	*****	*****	*****	*****	*****	*****	*****	DI_ADC_Smooth	DI_Type3	DI_Type2	DI_Type1	DI_Used	*****	*****

DI_Used	<p>Enable Digital Input</p> <p>0: Disable</p> <p>1: Enable <default></p>
DI_Type	<p>Digital Input type</p> <p>0 (b000) : normal ADC (mV) : Unsigned integer <default></p> <p>1 (b001) : Logic High/Low : Unsigned integer</p> <p>2 (b010) : 4~20mA (%) : Float*100</p> <p>3 (b011) : 0~10V (%) : Float*100</p> <p>4 (b100) : 4~20mA (mA) : Float*100</p> <p>5 (b101) : 0~20mA (%) : Float*100</p> <p>6 (b110) : 0~20mA (mA) : Float*100</p>
DI_ADC_Smooth	<p>Digital Input ADC value smooth function</p> <p>0: Disable<default></p> <p>1: Enable</p>
*****	Reserved <0>

REG_DIO_DO_PAR1

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
DO_P_Duty7	DO_P_Duty6	DO_P_Duty5	DO_P_Duty4	DO_P_Duty3	DO_P_Duty2	DO_P_Duty1	DO_L_SleepKeep	DO_L_En	DO_Type	*****	*****	*****	*****	*****	*****

REG_DIO_DO_PAR2

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
*****	*****	*****	*****	*****	DO_P_Freq11	DO_P_Freq10	DO_P_Freq9	DO_P_Freq8	DO_P_Freq7	DO_P_Freq6	DO_P_Freq5	DO_P_Freq4	DO_P_Freq3	DO_P_Freq2	DO_P_Freq1

DO_Type	Digital Output mode 0 : Latch(Open Drain) Mode <default> 1 : PWM Mode
DO_L_En	Enable Digital Output (when Mode = 0) 0 : Disable < default > 1 : Enable
DO_L_SleepKeep	Digital Output Latched when sleep mode(when Mode = 0) 0 : Disable < default > 1 : Enable
DO_P_Duty	Digital Output duty cycle (when Mode = 1) 1~99 % <50%>
DO_P_Freq	Digital Output frequency (when Mode = 1) 1 ~2000 Hz <1000Hz>
*****	Reserved <0>

16(10H):

Ex: Preset DIO_1 status

Send command:

ID Number	Function Code	Register Address	Register Qty	Data Bytes	Data	Data	CRC
01H	10H	4000H	0002H	04H	6455H	03E8H	CDF2H

Lora gateway response:

ID Number	Function Code	Register Address	Register Qty	CRC
01H	10H	4000H	0002H	5408H

Lora gateway response error message:

ID Number	Function Code	Message code	CRC
01H	90H	02H	CDC1H

REG_DIO_ALL_PAR_1: 0x4000 (~0x4001)

REG_DIO_ALL_PAR_1_L

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
DO_P_Duty7	DO_P_Duty6	DO_P_Duty5	DO_P_Duty4	DO_P_Duty3	DO_P_Duty2	DO_P_Duty1	DO_L_SleepKeep	DO_L_En	DO_Type	DI_Type3	DI_Type2	DI_Type1	DI_Used	Vout_SleepKeep	Vout_En

REG_DIO_ALL_PAR_1_H

b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
*****	*****	*****	*****	DI_ADC_Smooth	DO_P_Freq11	DO_P_Freq10	DO_P_Freq9	DO_P_Freq8	DO_P_Freq7	DO_P_Freq6	DO_P_Freq5	DO_P_Freq4	DO_P_Freq3	DO_P_Freq2	DO_P_Freq1

Vout_En (REG_DIO_ALL_PAR_n_L:Bit0)	5V/200mA(max) power output supply 0: Disable 1 : Enable
Vout_SleepKeep (REG_DIO_ALL_PAR_n_L:Bit1)	5V/200mA(max) continue power output when MCU sleep 0: Disable <default> 1: Enable
DI_Used (REG_DIO_ALL_PAR_n_L:Bit2)	Enable Digital Input 0: Disable 1: Enable <default>
DI_Type (REG_DIO_ALL_PAR_n_L:Bit3~ Bit5)	Digital Input type 0 (b000) : normal ADC (mV) : Unsigned integer <default> 1 (b001) : Logic High/Low : Unsigned integer 2 (b010) : 4~20mA (%) : Float*100 3 (b011) : 0~10V (%) : Float*100 4 (b100) : 4~20mA (mA) : Float*100 5 (b101) : 0~20mA (%) : Float*100 6 (b110) : 0~20mA (mA) : Float*100
DO_Type (REG_DIO_ALL_PAR_n_L:Bit6)	Digital Output mode 0 : Latch(Open Drain) Mode <default> 1 : PWM Mode
DO_L_En (REG_DIO_ALL_PAR_n_L:Bit7)	Enable Digital Output (when Mode = 0) 0 : Disable < default > 1 : Enable
DO_L_SleepKeep (REG_DIO_ALL_PAR_n_L:Bit8)	Digital Output Latched when sleep mode(when Mode = 0) 0 : Disable < default > 1 : Enable
DO_P_Duty (REG_DIO_ALL_PAR_n_L:Bit9~ Bit15)	Digital Output duty cycle (when Mode = 1) 1~99 % <50%>
DO_P_Freq (REG_DIO_ALL_PAR_n_H:Bit0~ Bit10)	Digital Output frequency (when Mode = 1) 1 ~2000 Hz <1000Hz>

<p>DI_ADC_Smooth (REG_DIO_ALL_PAR_n_H:Bit11)</p>	<p>Digital Input ADC value smooth function 0: Disable<default> 1: Enable</p>
<p>***** (REG_DIO_ALL_PAR_n_H:Bit12~ Bit15)</p>	<p>Reserved <0></p>

Register Address Mappings

Address	Description	Attribute
0x3000	REG_DI_VAL_1: DI(AI) #1 Detection value	R (03H)
0x3010	REG_VOUT_CUR_VAL_1: Vout Current consumption #1 Detection value	R (03H)
0x3020	REG_DIO_EXCEP_STATUS: DIO Abnormal state	R (03H)
0x3021	REG_POWER_ELECTRICITY: Main power (mV)	R (03H)
0x4000(~0x4001)	REG_DIO_ALL_PAR_1: DIO#1 All parameter	R/W*** (03H/10H)
0x4010	REG_DIO_VOUT_PAR_1: DIO#1 Vout parameter	R/W (03H/06H)
0x4020	REG_DIO_DI_PAR_1: DIO#1 DI(AI) parameter	R/W (03H/06H)
0x4030	REG_DIO_DO_PAR1_1: DIO#1 DO parameter1	R/W (03H/06H)
0x4031	REG_DIO_DO_PAR2_1: DIO#1 DO parameter2	R/W (03H/06H)

***: When reading (03H) REG_DIO_ALL_PAR_x, it require 2 data numbers.