MODBUS to MQTT Gateway BL100





BL100 User Manual

Version V1.0

Issue Date: 2021-08-18

Shenzhen Beilai Technology Co., Ltd.

Website:www.iot-solution.com



Preface

Thanks for choosing BLIIoT Modbus to MQTT Gateway BL100. Reading this manual with full attention will help you quickly learn device functions and operation methods.

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Disclaimer

If any problem caused by network upgrading of telecommunication service provider, BLIIoT will not be liable for it. This Modbus to MQTT Gateway is mainly used for data transmission through GSM/SMS/GPRS/3G/4G. Please follow the instructions in the manual and pay attention to the tips of GSM/3G/4G wireless products. Any damages caused by wrong operation will be beyond warranty.

Revision History

Revision Date	Version	Description	Owner	
Aug 2, 2021 V1.0		Initial Release	XJH	



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1 Product Introduction

1.1 General Introduction

- BL100 is a Modbus to MQTT gateway based on cellular network. It supports Modbus RTU, Modbus TCP, MQTT, Alibaba Cloud, HUAWEI Cloud, King Pigeon Cloud, custom platform and transparent data transmission. Users can connect it to third-party server, cloud platform and SCADA easily.
- With built-in industrial GSM/GPRS/3G/4G communication module, BL100 has integrated stable and reliable 32-bit MCU based on embedded uCOSII real time operation system
- It supports Modbus Slave and Modbus Master with up to 320 extended datapoints for data collection. Users can configure high/low limit parameters according to various application requirement. If any threshold is triggered, device will send notification to users via SMS and transmit the data to monitoring center without operator on-site check



1.2 Application Illustration





1.3 Safety Introduction



Safety Notice

Please don't use the device where mobile phones are prohibited



Wireless Interference

This device uses GSM/GPRS/3G/4G wireless network, please pay attention to wireless interference.

1.4 Packing List

Before using the device, please make sure below parts are included in the package (Below pictures are for reference only. Please follow real product)

• 1x BL100 Gateway



• 1x 4PIN 3.5mm Female Connector



• 1x 8PIN 3.5mm Female Connector

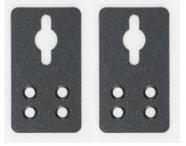


1x Micro_USB Cable





• 2 x Wall-Mounting Clip Buckle Kit(Optional)



• 1 x DIN Rail Clip Buckle Kit



• 1x 2G/3G/4G SMA Cellular Network Antenna



• 1 x Data Card Picking PIN



• 1 x Product Qualification Card



• 1 x Warranty Card

Modbus to MQTT Gateway



	保修	4
用户姓名	联系电话	购买日期
通讯地址		▲β 約 ₩
产品基本信息		(销售单位盖印)
问题简述		

 1 x User Manual (PDF soft copy) Note: Please scan QR code to download it.
 Note: if any of the above items are missing, please contact BLIIoT sales team

1.5 Product Features

- > Use 4G cellular network for communication without range limit
- Support 9~36VDC power supply with reverse connection protection
- 2 channels of built-in DC power output (Output power voltage is equal to input power voltage) to save wiring cost
- Simple and convenient parameter setting with local configuration software and remote SMS
- > Built-in software and hardware watchdog to prevent false deadlock
- > 1 RS485 serial port, support Modbus RTU to MQTT and transparent transmission
- Serial port baud rate supports 2400bps-115200bps; stop bit supports 1, 2, data bit supports 8, parity bit supports None, Odd, Even
- Support Modbus Slave protocol and can be connected to host computer like SCADA, HMI, DSC, PLC, etc. Support Modbus RTU Master and can connect up to 48 Modbus Slave devices with max 320 datapoints
- Support SMS alarm for monitoring various Modbus data, support configuration software parameter setting and SMS inquiry, if any communication problem, will notify users with SMS
- Use complete offline prevention mechanism to re-transmit offline data and notify users with SMS
- Support remote device restart and parameter setting with SMS
- Support 10 user numbers to receive device disconnection, serial port data beyond limit, and other alarm messages
- Built-in timer function to perform scheduled automatic data reporting, SMS, Arm/Disarm and device restarting
- Support PC configuration software to read, import, export parameters and upgrade firmware through USB interface



- Metal case, IP30 protection grade, metal case and PCBA are isolated safely, applicable in industrial sites
- > Compact size, support wall-mounting and 35mm DIN rail mounting

1.6 Technical Parameters

Category	Parameter	Description		
	Power Voltage	9~36V DC		
	Power Consumption	Normal: 50mA@12V, Max: 150mA@12V		
		• 2 channels		
Power Supply	Power Output	• Output voltage: 9~36V DC(equal to input voltage)		
		 Output current: 1500mA@12V(Max) 		
	Power Protection	Reverse connection protection, ESD air: 15KV, surge:4KV		
	Serial Port Qty	1x RS485		
	Baud Rate	1200bps-115200bps		
	Data Bit	8		
Serial Port	Parity Bit	None, Even, Odd		
	Stop Bit	1,2		
	Protocol	Modbus RTU (slave), Modbus RTU (master)		
	Protection	ESD contact: 8KV, surge: 4KV (8/20us)		
	Slot Qty	1		
SIM/UIM Card		Standard drawer type card slot, support 1.8V/3V nano		
Slot	Slot Type	card with built-in 15KV ESD protection		
		GSM/EDGE:900,1800MHz		
	L-E version	WCDMA:B1,B5,B8		
		FDD-LTE:B1,B3,B5,B7,B8,B20		
		TDD-LTE:B38,B40,B41		
		GSM/EDGE:900,1800MHz		
		WCDMA:B1,B8		
	L-CE version	TD-SCDMA:B34,B39		
		FDD-LTE:B1,B3,B8		
		TDD-LTE:B38,B39,B40,B41		
Cellular Network	L-A version	WCDMA:B2,B4,B5		
		FDD-LTE:B2,B4,B12		
		GSM/EDGE:850,900,1800MHz		
	L-AU version	WCDMA:B1,B2,B5,B8		
		FDD-LTE:B1,B3,B4,B5,B7,B8,B28		
		TDD-LTE:B40		
	L-AF version	WCDMA:B2,B4,B5		
		FDD-LTE:B2,B4,B5,B12,B13,B14,B66,B71		
	CAT-1 version	GSM:900,1800 FDD-LTE:B1,B3,B5,B8		
		TDD-LTE:B34,B38,B39,B40,B41		
		Modbus RTU, Modbus TCP, MQTT, HUAWEI Cloud,		
Software	Protocol	Alibaba Cloud, King Pigeon Cloud		
Parameter	Protocol Conversion	Support Modbus RTU to MQTT		
		Distance Boilai Technology Co. Ltd		

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	ladiaatar	Quatern munning, clarm, and DQ405 data indicators
	Indicator	System running, alarm and RS485 data indicators
	User Configuration	PC configuration software, support WIN XP, WIN 7, WIN 8 and WIN 10
	Slave Connection	Max 48 slave devices can be connected. Up to 320 mapping register addresses (Bool, 16-bit, 32-bit, 64-bit)
	Transparent Transmission	Support transparent transmission
	SMS Commands	Support SMS commands
	Login Package	Support custom login package
	Heartbeat Package	Support custom heartbeat package
	MTBF	≥100,000 hours
		EN 55022: 2006/A1: 2007 (CE &RE) Class B
		IEC 61000-4-2 (ESD) Level 4
		IEC 61000-4-3 (RS) Level 4
Certification	EMC	IEC 61000-4-4 (EFT) Level 4
		IEC 61000-4-5 (Surge)Level 3
		IEC 61000-4-6 (CS)Level 4
		IEC 61000-4-8 (M/S) Level 4
	Others	CE, FCC, ROHS
F as income and	Working Condition	-45~85°C, 5~95%RH
Environment	Storage Condition	-45∼105℃, 5~95%RH
	Case	Metal Case
	Size	83mm×30mm×100mm
Others	Protection Grade	IP30
	Net Weight	225g
	Mounting	Wall-Mounting/DIN Rail Mounting

1.7 Model Selection

			Serial Port	Extendable I/O Datapoint Qty				
No.	Model	2G/3G/4G	(Default is RS485, optional RS232)	Bool	16Bit	32Bit	64Bit	
1	BL100	\checkmark	1	64	128	64	64	
2	BL100Pro	\checkmark	2	64	128	64	64	



2 Hardware Introduction

2.1 Outline Dimension





2.2 LED Indicator

	49
ALARM	
тх 🔵	🔵 RX
VOUT+	
VOUT-	
TX/A1	100
RX/B1	100
GND	100
TX/A2	1
RX/B2	1000 C
GND	
BL1 CE ROHS	

	LED Indicator						
No.	Item	Color	Status	Description			
1	Alarm	Green	Steady on	Alarm is triggered			
1	Alaini	Green	Off	No Alarm			
			Flickering	Registering data card			
2	Run	Green	Steady on	Data card is successfully registered and system is running			
3	тх	Green	Flickering	Serial port is transmitting data			
3		Green	Off	No data			
4	DV	RX Green	Flickering	Serial port is receiving data			
4			Off	No data			

2.3 Interface Definition



	Interface Definition				
No. Interface Description					
1	VOUT +	2 nd power output positive			
2	VOUT -	2 nd power output negative			
3	TX/A1	1 st serial port A / TX			
4	RX/B1	1 ST serial port B / RX			
5	GND	Grounding			
6	TX/A2	2 nd serial port A / TX			
7	RX/B2	2 nd serial port B / RX			
8	GND	Grounding			



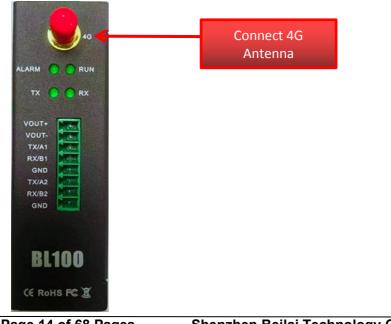


Interface Definition				
No.	Interface	Description		
1	USB	Connect configuration software for parameter setting and program upgrading		
2	SIM	Make sure device is powered off before inserting or removing SIM card		
3	RESET	In running mode, long press it for 5 seconds. Once all indicators are off and on again, reset is done successfully		
4	ON/OFF	Power ON / Power OFF device		
5	VOUT+	1 st power output positive		
6	VOUT-	1 st power output negative		
7	VIN+	Power input positive		
8	VIN-	Power input negative		
Power off the device first, insert picking PIN to card slot and eject slot with tiny force				

2.4 Debugging & Upgrading USB Interface

Micro USB interface is used to connect configuration software for firmware upgrading. Use standard Micro USB cable to connect this device and PC (CH340 driver must be installed first)

2.5 Antenna Connection



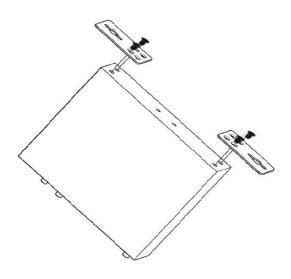
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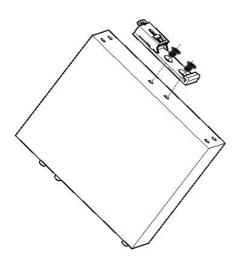
3 Product Mounting

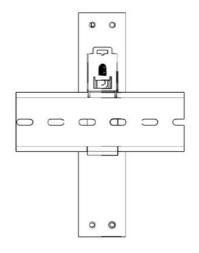
This device supports horizontal placement, wall-mounting and DIN Rail mounting.

3.1 Wall-Mounting



3.2 **DIN-Rail Mounting**





Assemble clip





4 Configuration Software Introduction

BL100 parameters are configured in PC software. It supports Windows XP/Vista/7/8/10 operation system through Micros USB connection.

4.1 **Preparation before Configuration**

4.1.1 USB Driver Installation

Option 1

Double click below USB to RS485 driver file. Download and unzip it to install on the computer



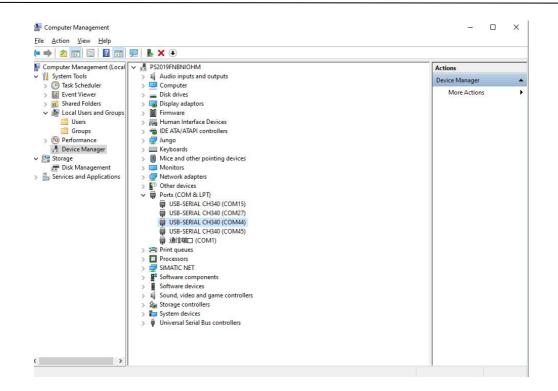
Option 2

Download universal driver program, for example, Drive the Life, and install it on the computer.

4.1.2 Search for Port Number

Right click [my computer], click [property] > [device manager] > [port] If driver installation and connection is normal, it will show like below (device port number is COM44)





4.2 Login to Configuration Software

 Execute BL100 configuration software in PC, select the correct COM port (the port shown in device manager), and click confirm as below picture:

MODBUS to MQTT	gateway BL100 Configuration Software V1.0	71 <u>_</u> 71	×
	Choose Port COM44 Velcome to use BEILAI technology BL100 M gateway 1. Connect the device to the computer USB 2. Configure serial port parameters. 3. Configure MODBUS address corresponde 4. Configure cloud platform parameters.	and turn on th	e.
	5. Complete Configure. Next(<u>O</u>) Cancel(<u>C</u>) Support device model : BL100		

 Select SIM card type (M2M card or normal SIM card) and click enter configuration page



MODBUS to MQT	T gateway BL100 Configuration Software — 🛛 🗆	×
Select SIM Ca	rd Category	
🔽 Normal SIM	Card(Call and SMS) 🗌 IOT M2M SIM Card(Data only)	
	Enter Setting	

• Once it's logged in successfully, it will enter below page

B MODBUS to MQTT gates	vay BL100 Configuration Software V1.0	2 <u>1-</u> 2	×
Load Configuration File	📲 Export Configuration File 📲 Factory Reset 🛛 Language 📓 About		
Serial Port	Serial Port 🔀		
Slave Mapping I	Channel 1		
- <u>R</u>	Mode ModBus RTU Master V Scan Rate 200 (200~65535mS)		
Self-Check	Baud Rate 9600 Data Bit 8 Timeout 200 (200~65535mS)		
Advanced functi			
	Parity Bit none Slave Error ACK Time 60 (0~65535 S)		
	2. Timeout can't less than 200ms. 3. Slave Error ACK Time: Stands for Slave no response longer than ACK time, will send SMS to authorized phone numbers. Read Save		
< >			
COM44	Device model:BL100 www.BLiiot.com		

4.3 Serial Port Configuration

 This part includes RS485 serial port functions and parameters, including Modbus RTU Master, Modbus RTU Slave and Transparent Transmission.



🛃 Load Configuration File 🛛 🐴 E:	port Configuration File 🛛 📳	Factory Reset Language	About					
Basic Setting	参数设置 × Cellular	Network \times Equipment Up	late $ imes $ Parameter $ imes$	$\langle $ Hour Timer $\times $	Alarm Numbers $ imes$	Serial Port	- X	
Parameter	Channel 1							
Alarm Numbe		rent transmission \sim	Scan Rate	5000 (200~6	5535mS)			
E Timer Setting	Baud Rate Close ModBus	RTU Master	Timeout		(5535mS)			
Hour Timer		RTU Slave ent transmission						
Periodic Time	Stop Bit 1	~	Slave Error ACK Tim	e 60 (0~655	(35 S)			
Serial Port Setting								
Serial Port			Notice: 1. Scan Rate can't le	ss than 200mS.				
Slave Setting			2. Timeout can't les 3. Slave Error ACK T	s than 200mS. ime: Stands for Slave no				
Mapping Reg				in ACK time, will send SN	IS to			
Cloud Platform Setti			Read	Save	Ĩ			
Cellular Netwo			i i i i i i i i i i i i i i i i i i i	Jure				
Equipment Update								
Equipment Up								
Self-Detection								
Self-Detection								

Note: "Poll Cycle", "Timeout", "Master and Slave Disconnection Acknowledgement Time" will only be valid when RS485 is used as Modbus RTU Master

Serial Port Configuration							
Item	Description	Default					
RS485	Select from "disabled", "ModBus RTU Master", "ModBus RTU Slave" and "Transparent Transmission"	Disabled					
Baud Rate	Select from 1200, 2400,4800,9600,19200,38400, 57600, 115200	9600					
Data Bit	8	8					
Parity Bit	Select from none, even, odd	none					
Stop Bit	Select 1, 2	1					
Polling Cycle	The time interval between 2 consecutive commands unit: ms	200					
Timeout	Max time duration of waiting after Master sends command to slave (unit: ms). If waiting for more than the limit, then system will identify slave has no response data	200					
Timeout Acknowledgement Time	If communication between master and slave fails, after the set time duration, system will send SMS alarm to user	60					

4.4 Slave Mapping Table

Slave devices can be quickly added, modified and deleted. Please read mapped slave information once enter slave mapping table so that the new added slave will not replace the old slave. Select the slave and right click it to delete, add or modify parameters.



Slave Mapping Table

Right click the box and clik Add Slave to enter below page MODBUS to MQTT gateway BL100 Configuration Software V1.0 × 🖷 Load Configuration File 🔺 Export Configuration File 📲 Factory Reset Language 🗐 About Slave Mapping List 🔀 Co Serial Port 序号 从机地址 数据类型 功能码 寄存器起始地址 映射寄存器数量 映射寄存器起始地址 映射寄存器结束地址 通道 Slave Mapping List 1 💀 Setting Slave × Cellular network set 2 Self-Check 3 Advanced functions 5 Slave Serial Number 6 7 Slave Address (Range 1~254) OK Data Type Boolean 8 9 Modbus Function Code Boole Word Cancel 10 Register Starting Addr. Integer 11 Mapping Register Qty. Double 12 Mapping Register Starting Addr. 64 13 14 15 Tips: 1. Register Starting Addr. : In Slave, from which register address starting to mapping to RTU, no need to setup the end register address, the RTU will automatically calculate it according to mapping register Qty. 2. Mapping Register Qty. : How many registers in slave need to mapping to ortic 16 Notice: 1. Before adding device, pls click "Read" buttor 2. Select a blank line, right click to add mappin 3. Max adding 48 devices Save 3. Mapping Register Starting Addr. : In RTU, from which register address used to save the mapping register address value. No need to setup the end register address, the RTU will automatically calculate it according to mapping register Qty. 4. The Data Type and Modbus Function Code of the mapping registers must Hold register Command 06 command Coil command 05 command ~ modify < COM44 www.BLijot.cn Device Type:BL100

Add Slave@Slave Setting							
Item	Description	Default					
No.	Item No.						
Slave Address	Slave Device Address, range 1-247	Null					
Register Type	Select from "Bool", "16-bit", "32-bit", "64-bit"	Bool					
Function Code	Select from "01", "02", "03", "04", "15", "16"	Null					
Slave Register Starting Address	Slave register starting address to be read and written	Null					
Slave Qty to be Read	Qty of Slave to be read	Null					
BL100 Mapping Register Starting Address	BL100 register starting address mapped by Slave register starting address	Null					
BL100 Mapping Register Ending Address	BL100 register ending address is automatically calculated according to starting address and reading qty.	Null					
Holding Register Control Function Code	Hold register Command 06 commar V modify	Default 16					
Coil Control Function Code	Coil command 05 commai ~ modify	Default 15					



Note: Usually it's OK to keep the default setting without any changes. If any devices can't support 05 15 or 06 16 function codes, then set the function code supported by the device

Edit Slave

Select the slave and right click it to enter below operation window.

Parameter	Provide and a second sec	Slave Address	Data Type	Modbus Function Code	Register Startin	g Addr. Mapping Register Qty.	Mapping Register Starting Addr.
Alarm Numbe	L.	2	Boolean	1	0		64
	2	2	Word	3	0	Edit Slave	20000
C Timer Setting	3	2	Integer	3	1	Edit Slave	20128
9000 cm	4	2	Double	3	3	Write Value	20256
Hour Timer	5					Delete Slave	
Periodic Timer	6						
nu San	7					Clear Display	
Serial Port Setting	8						
Serial Port	9						
Start	10						
Slave Setting	11						
Slave Mapping	12						
	13						
Mapping Regi	14						>
Cloud Platform Setti							,
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Notice:			r	Delete R	ead Save	
Cellular Netwo	1. before adding		'Read" button,	to read			
Equipment Update	mapping device I 2. Select a blank			4			
	2.14 11 45		add mapping	device			
~							
Equipment Up			ı ∨ modify				
Sect	Hold register Com	india to comme					
Self-Detection		mand 05 comma		]			
Sure Sure							
Self-Detection							

## Click Edit Slave to enter below page Boolean slave editing page:

ave Manning L	Slave Serial Number	Sla	ve Addres	s Data Type Mo	dbus Function Co	de Register S	tarting Addr.	Mapping Reg	ister Otv. M	apping Registe	er Start
Slave Ed	tor										×
elle Channel elf-Name	Data Type		Ratio	Alarm Verify Time(0~65535)	Th <mark>reshold</mark> high	Threshold low	High Alarm SMS Content	Low Alarm SMS Content	Recovery SMS Content	Enable Recovery SMS	Enal
dvpouble20256	DATA_DOUBLE_ABCDEFGH	×	1	2	0	0					
Double20260			1	2	0	0					
Double20264	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0					
Double20268	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0					
Double20272	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0					
Double20276	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0					
Double20280	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0					
Double20284	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0					
Double20288	DATA_DOUBLE_ABCDEFGH	×	1	2	0	0					
Double20292	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0					
				OK	Cancel					Q	>
<											

16-bit/32-bit/64-bit slave editing page:

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#### Modbus to MQTT Gateway

#### - BL100

Address Mapping	Channel Name	Data Type	1	Ratio	Alarm Verify Time(0~65535)	Threshold high	Threshold low	High Alarm SMS Content	Low Alarm SMS Content	Recovery SMS Content	E Re
20002	Int20002	DATA_SIGNED_AB	~	1	2	0	0				
20003	Int20003	DATA_SIGNED_AB	~	1	2	0	0				
			_								
Slave Editor Address	Channel	Data Type		Ratio	OK Cancel	Threshold	Threshold	High Alarm SMS	Low Alarm SMS	– D	E
Address Mapping	Name			10000000	Alarm Verify Time(0~65535)	high	low			Recovery	) E Re
Address Mapping 20128	Name DInt20128	DATA_LONG_ABCD	~	1	Alarm Verify Time(0~65535) 2	high 0	low 0	SMS	SMS	Recovery SMS	E Re
Address Mapping 20128 20130	Name DInt20128 DInt20130	DATA_LONG_ABCD DATA_LONG_ABCD	-	1	Alarm Verify Time(0~65535) 2 2	high 0 0	low 0 0	SMS	SMS	Recovery SMS	Re
Address Mapping 20128	Name DInt20128	DATA_LONG_ABCD	-	1	Alarm Verify Time(0~65535) 2	high 0	low 0	SMS	SMS	Recovery SMS	Re

#### OK Cancel

Edit Slave@Slave Mapping Table						
ltem	Description	Default				
Mapping Address	BL100 mapping address corresponding to slave register address					
Channel Name	Can be set, Once alarm is triggered, device will send SMS "channel name"+"alarm content". If alarm is recovered, device will send "channel name"+"alarm recovery content" to the authorized phone number. Enable Recovery SMS must be ticked in user number setting for receiving recovery SMS					
	<ul> <li>Boolean Can't be set. It's selected when adding Slave</li> </ul>	Bool				
Data Type	<ul> <li>16-bit/32-bit/64-bit</li> <li>Can be set according to slave datapoint type.</li> <li>ABCDEFGH represents slave register datapoint</li> </ul>	ABCDEF GH				



	sequence	
Input Type (Boolean Slave)	<ul> <li>NO: Normal Staus is Open (0)</li> <li>NC: Normal Status is Closed (1)</li> </ul>	NO
Ratio (16-bit/32-bit/64-bit Slave)	The data in mapping address will multiply the ratio. Multiplied value will compare with high and low threshold. Once it's beyond the limit, alarm will be generated. Alarm content and current value will be sent to authorized user number. This ration only applies to cloud platform. It's not applicable for GPRS/3G/4G data collection	1
Alarm Verify Time	If abnormal data keeps for more than the verification time, device will send SMS to authorized number	2
Threshold High	If mapping address data multiplies ration is higher than	
(16-bit/32-bit/64-bit Slave)	the threshold and alarm is enabled, device will send SMS "Channel name+high limit alarm content" to authorized numbers	Null
Threshold Low	If mapping address data multiplies ration is lower than the	
(16-bit/32-bit/64-bit Slave)	threshold and alarm is enabled, device will send SMS "Channel name+low limit alarm content" to authorized numbers	Null
High Alarm SMS Content	If there's high limit alarm, send SMS "Channel name+high limit alarm content"	Null
Low Alarm SMS Content	If there's low limit alarm, send SMS "Channel name+low limit alarm alarm content"	Null
Alarm SMS Content	If there's alarm, send SMS "Channel name+alarm content"	Null
Recovery SMS Content	If alarm is recovered, send SMS "Channel name+Recovery Content" to authorized numbers	Null
Enable Recovery SMS	It's ticked, alarm recovery SMS will be sent	Not ticked

Note: If SMS alarm is needed, it's necessary to tick Slave Alarm for authorized numbers in user number setting

### 4.5 **Cloud Platform Connection Configuration**

This page is used to configure device to connect to internet. Abundant automatic handshake package, custom heartbeat message and logout mechanism work together so that this device is compatible with many third-party cloud platforms and host computer system. Two-way communication between device and monitoring software or cloud platform is done through 4G cellular network It supports below platforms:

- ♦ King Pigeon Cloud 3.0 login address: kpiiot.com
- ♦ King Pigeon Cloud 2.0 via Modbus login address: www.my-m2m.com
- King Pigeon Cloud 2.0 via MQTT login address: www.my-m2m.com
- ♦ HUAWEI IOT login address: www.huaweicloud.com
- Alibaba IOT login address: www.aliyun.com
- Other self-built platforms



### 4.5.1 King Pigeon Cloud 3.0

	VOUGTAG	KPIIOT 2.0	KPIIOT 2	2.0			Other IOT		
Cellular network	KPIIOT 3.0	(Modbus)	(MQTI	D Hua	Vei Clould ALi	Clould	Server		
Self-Check	Cellular Network Se	-						_	
200	Communication I				Server 1 IP/DN			(Max60)	
Advanced functio		Modbus RTU F	Prote ~		Server Listen Por		(0-65535)	- 10	
	Protocol	ТСР	~	-	Server 2 IP/DN	-	-	(Max60)	
	Access Point Name			(Max60)	Server Listen Por		(0-65535)		
	APN User Name			(Max60)	Heartbeat Interva		(1-9999 S)		
	APN Passsword			Max60)	No Response Resenc	Times 3	~ (1-9)		
	Logout Mess				(Max60)				
	Login ACK Mess	age ASCII 🗸			(Max60)				
	Logout Mess	age ASCII ~			(Max60)				
		age ASCII 🗸	req		(Max60)				
	Heartbeat Mess								
	Heartbeat Mess		res		(Max60)				
		sage ASCII 🗸		erver	(Max60)				
	Heartbeat ACK Mess	sage ASCII 🗸		erver	(Max60)				
	Heartbeat ACK Mess	sage ASCII 🗸		erver	(Max60)				
	Heartbeat ACK Mess	sage ASCII 🗸		erver	(Max60)				
	Heartbeat ACK Mess	sage ASCII 🗸		erver	(Max60)				
	Heartbeat ACK Mess	sage ASCII 🗸		erver	(Max60) *				
	Heartbeat ACK Mess	ategy Send On			(Max60)	Read	Save		

Note: Only Login Message needed to be entered for connecting King Pigeon cloud. Others keep the default settings

King Pigeon Cloud 3.0@Network Setting								
Item	Description	Default						
Communication protocol	If King Pigeon Cloud 3.0 is selected, keep the default configuration software parameters							
Connection Mode	ТСР	TCP						
APN (Access Point Name)	Telecommunication service provider APN	Null						
APN User Name	User name of APN to connect to network	Null						
APN Password	Password of APN to connect to network	Null						
Login Message	Unique device serial number (Contact BLIIoT sales team)							
Login ACK Message	default	Null						
Logout Message	default	Null						
Heartbeat Message	req	Default						
Heart ACK Message	res	Default						
Login Message Strategy	default	Send once to login						
Server 1 IP/DNS	modbusrtu.kpiiot.com	Default						
Server Listen Port	Target server 1 port number	4000						
Server 2 IP/DNS	Target server 2 domain name or IP	Null						

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Server Listen Port	Target server 2 port number (0-65535)	Null
Heartbeat Interval	If connection to server fails for 3 times, it will reconnect after the set interval. Unit: second (1-9999) seconds	60
No Response Resend Times	If no response(login acknowledgement and heartbeat acknowledgement message is set) from server, data will be sent again for the set times (1-9)	3

### 4.5.2 King Pigeon Cloud 2.0 via Modbus

oad Configuration File	Export Configuration	AND ALCONA	s 51526725200	Language 🛛 🚺 Ab	out				
Serial Port	Serial Port X C	ellular networ	k setting 🗙						
Slave Mapping Li	KPIIOT 3.0	KPIIOT 2.0 (Modbus)		Hua	Wei Clould ALi (	Clould	Other IOT Server		
- Conf	Cellular Network Set	tings							
Self-Check	Communication P				Server 1 IP/DN		uip.com	(Max60)	
Advanced functio		Modbus RTU	Prote ~		Server Listen Por	-	(0-65535)	7	
	Protocol	TCP	~		Server 2 IP/DN	-	_	(Max60)	
	Access Point Name			(Max60)	Server Listen Por	t	(0-65535)		
	APN User Name			(Max60)	Heartbeat Interva	60	(1-9999 S)		
	APN Passsword			(Max60)	No Response Resend	Times 3	~ (1-9)		
	Login Messa		HS765XN8Y	V16725Y	(Max60) (Max60)				
		age ASCII 🗸	HS765XN8Y	V16725Y					
	Login ACK Messi Logout Messi Heartbeat Messi	age ASCII ~ age ASCII ~ age ASCII ~	Q	V16725Y	(Max60)				
	Login ACK Messa Logout Messa	age ASCII ~ age ASCII ~ age ASCII ~	Q	VV16725Y	(Max60) (Max60)				
	Login ACK Messi Logout Messi Heartbeat Messi	age ASCII ~ age ASCII ~ age ASCII ~ age ASCII ~	Q		(Max60) (Max60) (Max60)				
	Login ACK Messi Logout Messi Heartbeat Messi Heartbeat ACK Messi	age ASCII ~ age ASCII ~ age ASCII ~ age ASCII ~	Q		(Max60) (Max60) (Max60)				
	Login ACK Messi Logout Messi Heartbeat Messi Heartbeat ACK Messi	age ASCII ~ age ASCII ~ age ASCII ~ age ASCII ~	Q		(Max60) (Max60) (Max60)				
	Login ACK Messi Logout Messi Heartbeat Messi Heartbeat ACK Messi	age ASCII ~ age ASCII ~ age ASCII ~ age ASCII ~	Q		(Max60) (Max60) (Max60)				
	Login ACK Messi Logout Messi Heartbeat Messi Heartbeat ACK Messi	age ASCII ~ age ASCII ~ age ASCII ~ age ASCII ~	Q		(Max60) (Max60) (Max60)				
	Login ACK Messi Logout Messi Heartbeat ACK Mess Login Message Stra	age ASCII ~ age ASCII ~ age ASCII ~ age ASCII ~	Q A Acce When Log	gin Server	(Max60) (Max60) (Max60)	Read	Save		
	Login ACK Messi Logout Messi Heartbeat ACK Mess Login Message Stra	age ASCII ~ age ASCII ~ age ASCII ~ age ASCII ~ tregy Send Or	Q A Acce When Log	gin Server	(Max60) (Max60) (Max60)	Read	Save		
	Login ACK Messi Logout Messi Heartbeat ACK Mess Login Message Stra	age ASCII ~ age ASCII ~ age ASCII ~ age ASCII ~ tregy Send Or	Q A Acce When Log	gin Server	(Max60) (Max60) (Max60)	Read	Save		

#### Note: Only Login Message needed to be entered. Others keep the default setting

King Pigeon Cloud 2.0 via Modbus@Network Setting			
ltem	Description	Default	
Communication Protocol	If King Pigeon Cloud 2.0 (Modbus) is selected, keep the default configuration software parameters		
Connection Mode	TCP	TCP	
APN (Access Point Name)	Telecommunication service provider APN	Null	
APN User Name	User name of APN to connect to network	Null	
APN Password	Password of APN to connect to network	Null	
Login Message	Unique device serial number		

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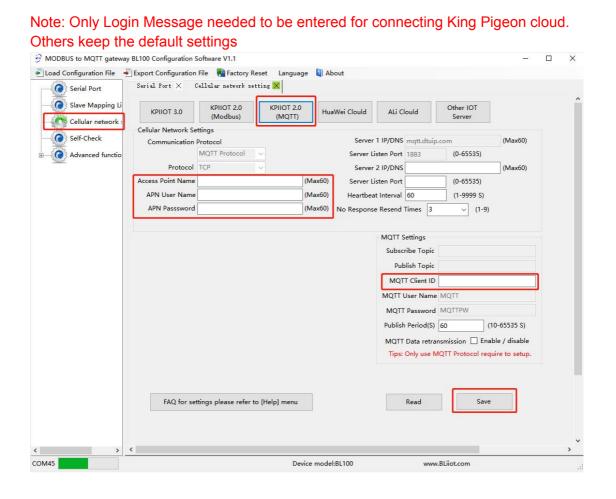
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Website: www.iot-solution.com



	(Contact BLIIoT sales team)	
Login ACK Message	Default	Null
Logout Message	Default	Null
Heartbeat Message	Q	Default
Heartbeat ACK Message	A	Default
Login Message Strategy	Default	Send once to login
Server 1 IP/DNS	modbus.dtuip.com	Default
Server Listen Port	Target server 1 port number	6651
Server 2 IP/DNS	Target server 2 domain name or IP	Null
Server Listen Port	Target server 2 port number (0-65535)	Null
Heartbeat Interval	If connection to server fails for 3 times, it will reconnect after the set interval. Unit: second (1-9999) seconds	60
No Response Resend Times	If no response(login acknowledgement and heartbeat acknowledgement message is set) from server, data will be sent again for the set times (1-9)	3

#### 4.5.3 King Pigeon Cloud 2.0 via MQTT



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•	King Pigeon Cloud 2.0 via MQTT@Network Setting			
Item	Description	Default		
APN (Access Point Name)	Telecommunication service provider APN	Null		
APN User Name	User name of APN to connect to network	Null		
APN Password	Password of APN to connect to network	Null		
Server 1 IP/DNS	mqtt.dtuip.com	Default		
Server Listen Port	Target Server 1 port number	1883		
Server 2 IP/DNS	Target Server 2 domain name or IP	Null		
Server Port Number	Target server 2 port number (0-65535)	Null		
Heartbeat Interval	If connection to server fails for 3 times, it will reconnect after the set interval. Unit: second (1-9999) seconds	60		
No Response Resend Times	If no response(login acknowledgement and heartbeat acknowledgement message is set) from server, data will be sent again for the set times (1-9)	3		
Subscribe Topic	Topic of subscribing message/+	Automatically generated based on MQTT Client ID		
Publish Topic	Topic of device publishing message	Automatically generated based on MQTT Client ID		
MQTT Clent ID	Unique device serial number (Contact BLIIoT Sales team)			
MQTT User Name	Account for device to publish topic in broker server	MQTT		
MQTT Password	Password for device to publish topic in broker server	MQTTPW		
Publish Period	Interval for device to upload data (10-65535) unit: second	10		
MQTT Data Re-transmission	Tick it to enable offline data re-transmission once network resumes	Enable/Disable		



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#### 4.5.4 HUAWEI Cloud Configuration

Load Configuration File	Export Configuration File 📲 Factory Reset Language 🗧 About	
	Serial Port X Cellular network setting 🗙	
Slave Mapping Li	KPIIOT 3.0         KPIIOT 2.0 (Modbus)         KPIIOT 2.0 (MQTT)         HuaWei Clould         ALi Clould         Other IOT Server	Í
	Cellular Network Settings	
Self-Check	Communication Protocol	
Advanced functio	HuaWei Cloud 🗸	
36.0	Protocol TCP	
	Access Point Name (Max60) Region North China(Bt v	
	APN User Name (Max60) Heartbeat Interval 60 (1-9999 S)	
	APN Passsword (Max60) No Response Resend Times 3 v (1-9)	
	Secret Key	
	Device Certificate Select File Update	
	Device Private Key Select File Update	
	MQTT Data retransmission Enable / disable Clear Certificate	
	FAQ for settings please refer to [Help] menu Read Save	
	FAQ for settings please refer to [Help] menu Read Save	
	FAQ for settings please refer to [Help] menu Read Save	

HUAWEI Cloud Configuration			
Item	Description	Default	
APN (Access Point Name)	Telecommunication service provider APN	Null	
APN User Name	User name of APN to connect to network	Null	
APN Password	Password of APN to connect to network	Null	
Authentication Method	Device Secret Key	Default	
Device ID	Set the same device ID as that in HUAWEI Cloud (device-device ID)	Refer to 5.2.3	
Secret Key	Set the same secret key as that of HUAWEI Cloud when creating device. If it's lost, reset the password in device authentication method	HUAWEI Cloud	
Service ID	Service ID created in HUAWEI Cloud		
Publish Period	Interval of publishing data, (10-65535) unit: second	60	
MQTT Data Re-transmission	Tick it to enable offline data re-transmission once network resumes	Disable	
Region	Select HUAWEI Cloud region. Default is North China Beijing 4	Default	
Heartbeat Interval	If connection to server fails for 3 times, it will reconnect after the set interval. Unit: second	60	
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	(1-9999) seconds	
No Response Resend Times	If no response(login acknowledgement and heartbeat acknowledgement message is set) from server, data will be sent again for the set times (1-9)	3
X509 certificate	Can't support it currently	

#### 4.5.5 Alibaba Cloud Configuration

	Export Configuration File     Image: A configuration File     Image: A configuration File     Serial Port X Cellular network setting X	
Slave Mapping Li	KPIIOT 3.0 KPIIOT 2.0 KPIIOT 2.0 (MQTT) HuaWei Clould ALi Clould Server	
Cellular network	Cellular Network Settings Communication Protocol	
	Access Point Name     (Max60)     Region     North China 1       APN User Name     (Max60)     Heartbeat Interval 60     (1-9999 S)       APN Passsword     (Max60)     No Response Resend Times     3     (1-9)	
	Authentication Method     Device Sert       Product Private Key	
	Device Private Key       Publish Period(S)       60       (10-65535 S)       MQTT Data retransmission       Enable / disable	
	Publish Period(S) 60 (10-65535 S)	

Alibaba Cloud Configuration			
ltem	Description	Default	
APN (Access Point Name)	Telecommunication service provider APN	Null	
APN User Name	User name of APN to connect to network	Null	
APN Password	Password of APN to connect to network	Null	
Authentication Method	Device Secret Key	Default	
Product Private Key	Set ths same ProductKey as Alibaba cloud (Device-click Device Secret to view it)	Refer to	
Device Name	Set the same DeviceName as Alibaba Cloud (Device—Click DeviceSecret to view it)	<u>5.2.4</u> <u>Alibaba</u>	
Device Private Key	Set the same DeviceSecret as Alibaba Cloud. (Device—Click DeviceSecret to view it)	<u>Cloud</u> <u>Application</u>	
Publish Period	Interval of publishing data, (10-65535)	60	

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	Unit: second	
MQTT Data Re-transmission	Tick it to enable offline data re-transmission once network resumes	Disable
Region	Select Alibaba Cloud region. Default is East China 2 (Shanghai)	Default
Heartbeat Interval	If connection to server fails for 3 times, it will reconnect after the set interval. Unit: second (1-9999) seconds	60
No Response Resend Times	If no response(login acknowledgement and heartbeat acknowledgement message is set) from server, data will be sent again for the set times (1-9)	3

### 4.5.6 Other IOT Server (Custom Protocol)

Load Configuration File Ferial Port Serial Port Serial Port Cellular network Serial Port X Cellular network setting Cellular Network Settings Communication Protocol Communication Protocol TCP Advanced function Protocol TCP Advanced function No Response Resend Times Login Message defecter to of cloudy, and click tave Max600 No Response Resend Times No Response Resend Times Subsist To protocol Communication Protocol Protocol TCP Advanced function Protocol TCP Advanced function Protocol TCP Advanced function Protocol TCP Advanced function Protocol TCP Access Point Name (Max60) No Response Resend Times Votocol TCP Access Point Name (Max60) Heartbeat Intervale Moltish Topic Dublish Topic Moltish Period(S) 660 (10-65535 S) MQTT Data retransmission FAQ for settings please refer to (Help) menu Read Save Save	MODBUS to MQTT gateway	ay BL100 Configuration Software V1.1 –	×
Server       Server         Slave Mapping L       KPIOT 3.0       KPIOT 2.0 (ModDu)       HuaWei Cloud       ALi Cloud       Server         Cellular network       Cellular Network Settings       Communication Protocol       ALi Cloud       Server         Advanced functio       ALi Cloud       Vertex       Region       North China 1 vertex         Advanced functio       Access Point Name       (Max60)       Region North China 1 vertex         APN Vuser Name       (Max60)       No Response Resend Times 3 vertex       (1-9)         Visit fill in the login message(device 1D of cloud), and click tase       MQTT Settings       Subscribe Topic         Login Message ASCII       (Max60)       Max60       MQTT Client 1D         Heartbeat Message ASCII vertex       (Max60)       MQTT Data retransmission = Enable / disable         Tips: Only use MQTT Protocol require to setup.       FAQ for settings please refer to [Help] menu       Read       Save	Load Configuration File	🌒 Export Configuration File 🛛 🌉 Factory Reset 🛛 Language 📓 About	
Cellular network     Cellular network     Cellular Network Settings       Communication Protocol     Ait Cloud     Server       Self-Check     Ait Cloud     V       Advanced functio     Protocol     TCP       Access Point Name     (Max60)     Region     North China 1 v       APN User Name     (Max60)     Response Resend Times 3 v     (1-9999 S)       Protocol     TCP     (Max60)     No Response Resend Times 3 v     (1-9)       Pis mil in the togin message(device 1D of cloud),and click tave     MQTT Settings     Subscribe Topic       Login Message     ASCII v     (Max60)     No Response Resend Times 3 v     (1-9)       Pis mil in the togin message(device 1D of cloud),and click tave     MQTT Settings     Subscribe Topic     Publish Topic       Login ACK Message     ASCII v     (Max60)     MQTT Dia retransmission     Enable / disable       Tips: Only use MQTT Protocol require to setup.     FAQ for settings please refer to [Heip] menu     Read     Save	Serial Port	Serial Port X Cellular network setting 🗙	
Cellular Network Settings         Communication Protocol         Ald Cloud         Protocol         TCP         Access Point Name         (Max60)         APN User Name         (Max60)         APN User Name         (Max60)         APN User Name         (Max60)         APN Bassaword         (Max60)         APN Bassaword         Login Message (ASCII + Uof cloud), and click save         Login ACK Message (ASCII + H5765XNBV/16725Y         Login ACK Message (ASCII + H5765XNBV/16725Y         (Max60)         Heartbeat Message(ASCII + GOM (Max60)         Heartbeat ACK Message (ASCII + GOM (Max60)         Heartbeat ACK Message (ASCII + GOM (Max60)         Login Message Strategy Send Once When Login Server         Publish Period(S) 60         Icogin Message Strategy Send Once When Login Server         Publish Period(S) 60         MQTT Data retransmission         Inable / disable         Tips: Only use MQTT Protocol require to setup.         FAQ for settings please refer to [Help] menu         Read       Save			î
Advanced functio Advanc	- <u> </u>	Cellular Network Settings	
Big in North China 1       Region North China 1         Access Point Name       (Max60)         APN User Name       (Max60)         APN Passsword       (Max60)         No Response Resend Times 3       (1-9)         Pis fill in the login message(device 12 of cloud, and click save       MQTT Settings         Login Message       ASCII       (Max60)         Login Message       ASCII       (Max60)         Login Message       ASCII       (Max60)         Heartbeat Message       (Max60)       MQTT Settings         Subscribe Topic       Publish Topic       MQTT User Name MQTT         Heartbeat ACK Message ASCII       (Max60)       MQTT User Name MQTT         Upin Message Strategy Send Once When Login Server       Publish Period(S) 60       (10-65335 S)         MQTT Data retransmission       Enable / disable       Tips: Only use MQTT Protocol require to setup.         FAQ for settings please refer to [Help] menu       Read       Save	Self-Check	Communication Protocol	
Access Point Name       (Max60)       Region       North China 1 ~         APN User Name       (Max60)       No Response Resend Times 3 ~ (1-9)         Pis fill in the login message(device to of cloud),and click save       MQIT Settings         Login Message ASCII ~       (Max60)       MQIT Settings         Login Message ASCII ~       (Max60)       MQIT Client ID         Heartbeat Message ASCII ~       (Max60)       MQIT Client ID         Heartbeat Ack Message ASCII ~       (Max60)       MQIT Diare Name MQIT         Heartbeat Ack Message ASCII ~       (Max60)       MQIT Diare Name MQIT         Login Message Strategy Send Once When Login Server ~       Publish Period(S) 60 (10-65535 S)         MQIT Data retransmission C Enable / disable       Tips: Only use MQIT Protocol require to setup.         FAQ for settings please refer to [Help] menu       Read       Save	Advanced functio	ALi Cloud 🗸	
APN User Name       (Max60)       Heartbeat Interval       60       (1-9999 \$)         APN Passsword       (Max60)       No Response Resend Times       3       (1-9)         FIs fill in the login message(device ID of cloud), and click save       (Max60)       MQIT Settings         Login Message       ASCII       H5765XIN8VV16725Y       (Max60)         Login Message       ASCII       (Max60)       MQIT Settings         Login Message       ASCII       (Max60)       MQIT Client ID         Heartbeat Message       ASCII       Q       (Max60)         Heartbeat ACK Message       ASCII       Q       (Max60)         Login Message Strategy Send Once When Login Server       Vublish Poriod(5)       60       (10-65535 \$)         MQIT Data retransmission       Enable / disable       Tips: Only use MQIT Protocol require to setup.         FAQ for settings please refer to [Help] menu       Read       Save	79847	Protocol TCP 🗸	
APN Passsword       (Max60)       No Response Resend Times       3       (1-9)         Pis fill in the login message(device 1D of cloud),and click save       MQTT Settings         Login Message       ASCII       (Max60)       MQTT Settings         Subscribe Topic       Publish Topic       MQTT Client ID         Login Message       ASCII       Q       (Max60)         Heartbeat ACK Message       ASCII       Q       (Max60)         Heartbeat ACK Message       ASCII       Q       (Max60)         Login Message Strategy       Send Once When Login Server       MQTT Data retransmission       Enable / disable         Tips: Only use MQTT Protocol require to setup.       FAQ for settings please refer to [Help] menu       Read       Save		Access Point Name (Max60) Region North China 1 V	
ris fill in the login message (device ID of cloud), and click save         Login Message ASCII         Login ACK Message ASCII         Logout Message ASCII         Heartbeat Message (ASCII         Heartbeat ACK Message ASCII         Login Message (ASCII         Login Message (ASCII         Login Message (ASCII         Heartbeat Message (ASCII         Login Message (ASCII         Login Message (ASCII         A         Max60)         Login Message (ASCII         A         Max60)         Login Message (ASCII         A         Max60)         Login Message (ASCII)         A         Max60         Max60		APN User Name (Max60) Heartbeat Interval 60 (1-9999 S)	
Login Message       ASCII ~       HS765XN8YV16725Y       (Max60)         Login ACK Message       ASCII ~       (Max60)       Publish Topic         Logout Message       ASCII ~       (Max60)       MQTT Client ID         Heartbeat ACK Message       ASCII ~       (Max60)       MQTT User Name MQTT         Heartbeat ACK Message       ASCII ~       (Max60)       MQTT User Name MQTT         Login Message Strategy       Send Once When Login Server       NQTT Data retransmission   Enable / disable         Tips: Only use MQTT Protocol require to setup.       FAQ for settings please refer to [Help] menu       Read       Save		APN Passsword (Max60) No Response Resend Times 3 v (1-9)	
Login Message       ASCII ~       HS765XN8YV16725Y       (Max60)         Login ACK Message       ASCII ~       (Max60)       Publish Topic         Logout Message       ASCII ~       (Max60)       MQTT Client ID         Heartbeat ACK Message       ASCII ~       (Max60)       MQTT User Name MQTT         Heartbeat ACK Message       ASCII ~       (Max60)       MQTT User Name MQTT         Login Message Strategy       Send Once When Login Server       NQTT Data retransmission   Enable / disable         Tips: Only use MQTT Protocol require to setup.       FAQ for settings please refer to [Help] menu       Read       Save			
Login Message       ASCII ~       HS765XN8YV16725Y       (Max60)         Login ACK Message       ASCII ~       (Max60)       Publish Topic         Logout Message       ASCII ~       (Max60)       MQTT Client ID         Heartbeat ACK Message       ASCII ~       (Max60)         Login Message Strategy       Send Once When Login Server       MQTT Data retransmission [ Enable / disable         Tips: Only use MQTT Protocol require to setup.       FAQ for settings please refer to [Help] menu       Read       Save		Pis fill in the login messaget device ID of cloud and click save	
Login ACK Message ASCII ~ (Max60) Logout Message ASCII ~ Q (Max60) Heartbeat Message ASCII ~ Q (Max60) Login Message ASCII ~ A (Max60) Login Message Strategy Send Once When Login Server ~ MQTT Data retransmission [ Enable / disable Tips: Only use MQTT Protocol require to setup.			
Logout Message       ASCII ~ (Max60)       MQTT Client ID         Heartbeat Message       ASCII ~ Q       (Max60)         Heartbeat ACK Message       ASCII ~ A       (Max60)         Login Message Strategy       Send Once When Login Server ~       MQTT User Name MQTT         Publish Period(S)       60       (10-65535 S)         MQTT Data retransmission []       Enable / disable         Tips: Only use MQTT Protocol require to setup.         FAQ for settings please refer to [Help] menu       Read       Save			
Heartbeat Message ASCII > Q     (Max60)       Heartbeat ACK Message ASCII > A     (Max60)       Login Message Strategy Send Once When Login Server     MQTT User Name MQTT       MQTT Password MQTTPW     Publish Period(S) 60 (10-65535 S)       MQTT Data retransmission [] Enable / disable       Tips: Only use MQTT Protocol require to setup.			
Heartbeat ACK Message ASCII ~ A     Maxformation       Login Message Strategy Send Once When Login Server     MQTT Password MQTTPW       Publish Period(S)     60     (10-65535 S)       MQTT Data retransmission     Enable / disable       Tips: Only use MQTT Protocol require to setup.			
Login Message Strategy Send Once When Login Server  Publish Period(S) 60 (10-65535 S) MQTT Data retransmission  Enable / disable Tips: Only use MQTT Protocol require to setup.  FAQ for settings please refer to [Help] menu Read Save			
MQTT Data retransmission _ Enable / disable Tips: Only use MQTT Protocol require to setup. FAQ for settings please refer to [Help] menu Read Save		Heartbeat ACK Message ASCII V A (Max60) MQTT Password MQTTPW	
FAQ for settings please refer to [Help] menu Read Save		Login Message Strategy Send Once When Login Server V Publish Period(S) 60 (10-65535 S)	
FAQ for settings please refer to [Help] menu Read Save		MQTT Data retransmission 🗌 Enable / disable	
		Tips: Only use MQTT Protocol require to setup.	
		FAQ for settings please refer to [Help] menu Read Save	
			, ×
OM45 Device model:BL100 www.BLijot.com	:OM45		-

Custom Protocol Configuration								
Communication Protocol	Select according to user requirement							
Server IP/ Domain Name	User-defined							

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Server Listen Port	User-defined
Login Message	User-defined
Login ACK Message	User-defined (server response to login message)
Heartbeat Message	User-defined (heartbeat message to keep connection)
Heartbeat ACK Message	User-defined (Server response to heartbeat message)
Heartbeat Interval	Interval of sending heartbeat message,default is 60s
Login Message Strategy	User-defined

Note: Users set the parameters based on custom protocols and actual requirements. Note: Custom MQTT protocol data format is the same as King Pigeon Cloud 2.0 MQTT data format. Refer to <u>5.2.5 MQTT Application</u>. Modbus RTU and Modbus TCP are standard Modbus protocol. Refer to <u>Appendix 6.3, 6.4 and 6.5</u> for message details

#### 4.6 Device Self-Checking

BL100 supports self-checking before configuration

Below page shows self-checking is completed

startin fort       self-checking         Slave Mapping       self-checking         Self-Check       wemory detection complete         Success       Skip         Collular network       Skip         Collular network       Skip         Collular network       Skip         Collular network       Skip         Collar network       Skip         Skip       Skip         Collar network       Skip         Skip       Skip         Self-check completed       Skip         Self-check completed       Skip         Self-check completed       Skip         Self-check completen       Skip	Load Configuration File	ay BL100 Configuration Software V1.0 Export Configuration File Tactory Reset Language Seriel Port × Self-Check ×	About	:
Preparation before self inspection: 1. Put the 3 / 4G SIM card into the device 2. Connect the antenna to the device 3. You need to operate the keys during the self-test. Please check the prompts	Cellular network	self-checking         Memory detection complete         Clock detection complete         GSM communication detection completed         SIM card detection completed         GSM registration detection completed;4G module,Sig         Cellular network communication detection completed         Key detection completed         Serial port detection completed	success success SIM card inserted Registered success fail	Skip prompt X
	< >>	1. Put the 3 / 4G SIM card into the device 2. Connect the antenna to the device	self-test. Please ch	

Note: Insert SIM card, connect antenna properly and manually press self-check button to trigger it.



#### 4.7 Advanced Functions

#### 4.7.1 Parameter Configuration

In this section, users can quickly read and configure device basic information, including model, version, device time, device ID and description.

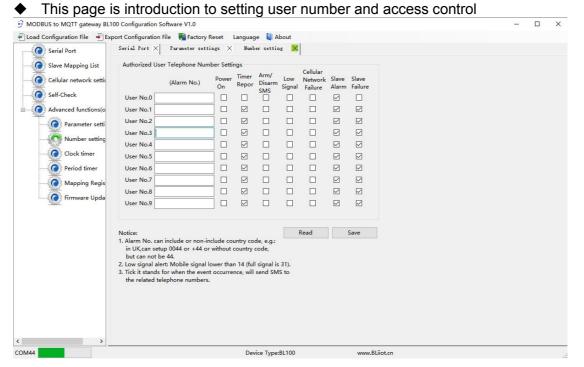
Slave Mapping List	Modify password Old password:	Synchronous machine time Time: 2021-08-19 09:22:44
Self-Check	Confirm password:	Time zone: (LTC+08:00) Read time Sync time
	Basic information Device ID 1 (1~247)	Model No. BL100 Version 4EH11
		(60 Byte)         IMEI         863418051081537           ] Arm Automatically when power on.         Signal         25           Winute(S)         (0~9999)
	Timer Reporting SMS Content Settings	
	Add the following additional information in the report SMS	Device ID Device Description
	$\hfill \hfill $	Device ID Device Description

	Sync Device Time@Basic Information	
Item	Description	Default
Time	Display/select device current time	
Read Time	Click it to read RTU time	
Sync Time	Click it to sync computer time to RTU	
Signal	Display device signal strength, range 0-31	Automatic
	General Operation@Basic Information	
Item	Description	Default
Device ID	Used as device ID address in ModBus protocol, range 1-247	1
Model Number	Automatically read device model number	
Version	Automatically read device version	
Device Description	If device description is set, it will be included in alarm SMS	Null
Add timestamp to alarm SMS	If ticked, SMS alarm content will include timestamp	Tick
Arm automatically when power on	If ticked, it will automatically be armed once powered on.Only in armed status alarm event will happen if it's triggered	Tick
Auto Arm after Disarm Set interval:	Once device is disarmed, it will be armed automatically after the set interval	Not Ticked



Timer Reporting @Basic Information							
ltem	Description	Default					
Add the following additional information in the report SMS	If following items are ticked and SMS reporting is set in timer, SMS will be sent to authorized number. To get regular SMS reporting, need to set SMS reporting in Timer, tick this item and set user number	Not ticked					
	Alarm SMS Setting@Basic Information						
Item	Description	Default					
Add the following additional information in	If following items are ticked, the status will be included in the SMS if there's any alarm and sent to authorized user	Not ticked					
the alarm SMS	number						

#### 4.7.2 User Number Setting



Note: For alarm SMS, please select according to actual requirement

	User Number Setting								
Item	Description	Default							
User No.	Total 10 user numbers can be set to receive SMS	Null							
Power On	If it's ticked, SMS will be sent to user number, including device model, version, description, IMEI, status, cellular network signal value, etc once device is powered on	Ticked							
Timer Report	If it's ticked, SMS will be sent to user number as scheduled reporting cycle	Ticked							
Arm/Disarm SMS	If it's ticked, SMS will be sent to user number if device arm/disarm status changes	Ticked							
Low Signal	If it's ticked, SMS will be sent to user number once cellular network signal value is less than 14	Not ticked							

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Cellular Network Failure	If it's ticked, SMS will be sent to user number once connecting to server fails for 3 times	Not ticked
Slave Alarm	If it's ticked, RS485 interface slave alarm will be sent to user number	Not ticked
Slave Communication Failure	If it's ticked, SMS will be sent to user number once the communication with RS485 interface slave timeout	Not ticked

Note: If alarm SMS is needed, please tick Slave Alarm in Number Setting

#### 4.7.3 Timer

In this page, users can quickly set device to perform certain actions in scheduled time to realize automatic control devices. Labor cost can be largely saved. Total 10 events can be set based on weekly, daily or certain time interval

#### 4.7.3.1 Clock Timer

Load Configuration File     Export     Serial Port	Configurati		Factor	y Reset Langu	age 🚺 About		
Slave Mapping List	ClockTim	ier					
Cellular network setting		Wee	kly	Hour	Minute	Action	
Self-Check	1	Sunday	~	00 ~	00 ~	Reboot 🗸	
Advanced functions(optio	2	Sunday	~	00 ~	00 ~	Reboot Upload Data By Cellular network	
Parameter settings	3	Sunday	~	00 ~	00 ~	Auto Report By SMS	
Number setting	4	Sunday	~	00 ~	00 ~	-NA- Arm	
Clock timer	5	Sunday	~	00 ~	00 ~	Disarm	
444	6	Sunday	~	00 ~	00 ~	Reboot ~	
Period timer	7	Sunday	~	00 ~	00 ~	Reboot 🗸	
Mapping Register	8	Sunday	~	00 ~	00 ~	Reboot 🗸	
Firmware Update	9	Sunday	~	00 ~	00 ~	Reboot ~	
	🗌 10	Sunday	~	00 ~	00 ~	Reboot ~	
						Read Save	
< >							
COM44				D	evice Type:BL100	www.BLiiot.cn	

Clock Timer								
ltem	Description	Default						
1-10	Refers to 1-10 Timer	Not ticked						
Weekly	Set any day of the week or every day							
Hour	Set specific hour							
Minute	Set specific minute							
A	Action to be performed once at certain time. Select from							
Action	"restart", "uploading cellular network data", "Auto Report by							
Page 34 (	Page 34 of 68 Pages Shenzhen Beilai Technology Co., Ltd.							

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SMS", "Arm", "Disarm"

#### 4.7.3.2 Period Timer

Serial Port	Clock ti	mer × 1	Mappin	g Register	×	Period tim	ner 🔀		
Slave Mapping List	Periodic								121210
Cellular network setting	□ 1	Weekly Sunday	-	Hour		Minu 00	- F	Interval(s)	Action Reboot
Self-Check			~	00	~		~		Reboot V
	2	Sunday	~	00	~	00	~	0	Upload Data By GPRS
Advanced functions(optio	3	Sunday	~	00	$\sim$	00	~	0	Auto Report By SMS -NA-
Parameter settings	4	Sunday	~	00	$\sim$	00	~	0	Arm
- Number setting	5	Sunday	~	00	~	00	~	0	Disarm
Clock timer	6	Sunday	~	00	~	00	~	0	Reboot V
Period timer	7	Sunday	~	00	~	00	~	0	Reboot v
345	8	Sunday	~	00	~	00	~	0	Reboot 🗸 🗸
	9	Sunday	~	00	~	00	~	0	Reboot ~
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start		every xxSecon is used for re					Read Save
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start ⁻ nen the cycle							Read Save
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start ⁻ nen the cycle							Read Save
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start ⁻ nen the cycle							Read Save
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start ⁻ nen the cycle							Read Save
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start ⁻ nen the cycle							Read Save
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start ⁻ nen the cycle							Read Save
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start ⁻ nen the cycle							Read Save
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start ⁻ nen the cycle							Read Save
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start ⁻ nen the cycle							Read Save
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start ⁻ nen the cycle							Read Save
Firmware Update	Notice 1. Frc 2. Wh	e: om the Start ⁻ nen the cycle							Read Save

	Period Timer								
Item	Description	Default							
1-10	Refers to 1-10 Timer	Not ticked							
Weekly	Set any day of the week or every day								
Hour	Set specific hour								
Minute	Set specific minute								
Action	Action to be performed once at certain time. Select from "restart", "uploading cellular network data", "Auto Report by SMS", "Arm", "Disarm"								

#### 4.7.4 Device Firmware Update

BL100 support online firmware update. Click Select to import program file and click Update. Once firmware update is 100% completed, restart the device



Serial Port	Cellular network setting $ imes$ Fir	mware Update 🔀							
<ul> <li>Slave Mapping List</li> <li>Cellular network settin</li> <li>Self-Check</li> <li>Advanced functions(o)</li> </ul>	Note: do not disconnect the power supply of the device during the upgrade process, otherwise the device will not be used!!!								
Parameter setti	File	]	Select Upgrade						
Period timer () Mapping Regis () Firmware Upda									
"Out"									
>									
14		Device model:BL100	www.BLijot.com						

#### 4.7.5 Mapping Register Data

Click [Mapping Register Data] to view slave device real-time value so that users can debug and install devices easily.

Serial Port	Serial Port	× Slave Mappin	g List $ imes$	Mapping Register	×							
Slave Mapping List	Boolean		16Bit		32位			64位				
	Register No.	Current Value	Register No.	Current Value	^	Register No.	Current Value	^	Register No.	Current Value	^	
Cellular network setti	64	1	20000	100		20128	500		20256	200		Tick it sta
Self-Check	65		20001 20002			20130			20260			automatic slaves, int
	66					20132			20264			
Advanced functions(o	67		20003			20134			20268			2 S
Parameter setti	68		20004 20005			20136			20272			
Parameter setti	69					20138		20276			Read	
Number setting	70		20006			20140			20280			
	71		20007			20142			20284			Notice: 1. Please go
Clock timer	72		20008			20144			20288			
Period timer	73		20009			20146			20292			button to re 2.Click the [
	74		20010			20148			20296			abovementi will be incor
Mapping Regis	75		20011			20150			20300			
Firmware Upda	76		20012			20152		20304				
	77		20013		20154			20308				
	78		20014			20156			20312			
	79		20015			20158			20316			
	80		20016			20160			20320			
	81		20017			20162			20324			
	82		20018			20164			20328			
	83		20019			20166			20332			
	84		20020			20168			20336			
	85		20021		20170			20340				
	86		20022			20172		20344				
	87		20023			20174		20348				
	88		20024		20176			20352				
	89		20025			20178			20356			
	90		20026		×	20180		, v	20360		, v	
	91 <	*	20027			20182			20364			

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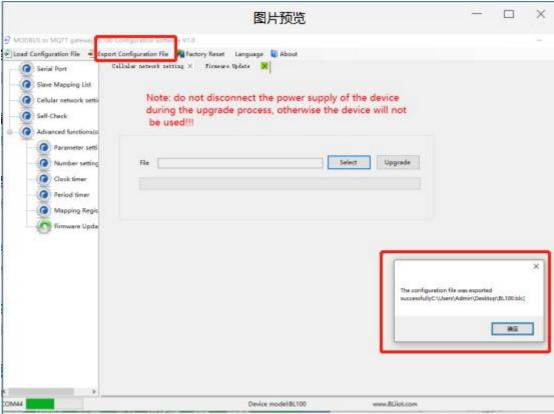
Website: www.iot-solution.com



Note: To read slave device data, click Read in Slave Mapping List first and then view it in Mapping Register Data

# 4.8 Export Configuration File

 Click top left button Export Configuration File, select file saving path and enter file name



• After a while, configuration exporting success window will pop out

### 4.9 Load Configuration File

• Click top left button Load Configuration File and select the file to upload it.



Serial Port	Callular network metting $\times$	Firmeare Opdate 🔀			
Slave Mapping List     Cellular network setsi     Self-Check     Advanced functionsto			ower supply of the o therwise the device		
Parameter setti     Number setting     Octok timer     Period timer     Mapping Regis	file		Select	Upgrade	
Firmware Upda				Landing confi	gunation information is successful
					ĂE.

• After a while, loading configuration success window will pop up

## 4.10 Factory Reset

 Once device is powered on, connect it with PC configuration software and click Factory Reset. After factory resetting notice box pops out, click confirm to complete it.



	81.100 Curifiguration Software 31.0 Export Configuration File 🙀 Factory Resetanguage 📓 About	240	6	×
Serial Port     Serial Port     Sieve Mapping List     Collular network settin     Self-Check     Advanced functionsic	Note: do not disconnect the power supply of the device during the upgrade process, otherwise the device will not be used!!!			
Parameter setti     Auriber setting     Octock timer     Octock timer     Operiod timer     OMapping Regis     Firmware Lipda	s File Upgrade			
	Is the device parameter initialized	× ntaly RCR		
c				

## **5** Device Application and Cloud Connection Example

## 5.1 Transparent Transmission (DTU) Setting

BL100 has DTU function of transparent data transmission. Data sent to BL100 from server or cloud platform via cellular network will be forwarded to RS485 interface. Data received from BL100 RS485 interface will be sent to server or cloud platform via cellular network. Detailed operation procedures are as below:

(1) In Parameter Setting Page, set device ID



Sec. 2	Serial Port X Parameter settings 🗙	Number setting $\times$		
Slave Mapping List		Modify password	Read time	Sync time
<ul> <li>Cellular network setti</li> <li>Self-Check</li> </ul>	Basic information Device ID	(1~247)	Model No. BL100	Version 4EH11
Advanced functions(o	Device Description: BL100TEST		(60 Byte) IMEI	863418051081537
Parameter setti	☑ Add timestamp to alar	n SMS 🖂 Arm Aut	omatically when power on.	Signal 25
Number setting	☑ Auto Arm after disarm:	1 Minute(S)	(0~9999)	
Clock timer	Timer Reporting SMS Content Settings			
Period timer	Add the following additional inform	ation in the report SMS		
Mapping Regis			Device ID	
Firmware Upda	Arm Status	GSM Signal Value	Device ID	Device Description
	Alarm SMS Content Settings			
	Add the following additional inform	ation in the alarm SMS		
	Arm Status	GSM Signal Value	Device ID	Device Description

Note: Device connected to RS485 interface can not have the same ID as BL100 ID

(2) In Serial Port setting, select Transparent Transmission as RS485 mode. Baud rate, data bit, parity bit and stop bit must be the same as those of RS485 interface device parameters. Otherwise the communication will not be successful

Load Configuration	on File 🚽 Expor	figuration Software V1.0 nfiguration File Ratory Reset Language About al Port Name hannel 1 Mode Transparent transmission	
		Baud Rate     Close     Scan Rate     200     (200~65535mS)       Data Bit     ModBus RTU Master     Timeout     200     (200~65535mS)       Parity Bit     Ifensparent transmission     Slave Error ACK Time     60     (0~65535 S)	
Pe Mu G	ock timer riod timer npping Regis mware Upda	Notice: 1. Scan Rate can't less than 200mS. 2. Timeout can't less than 200mS. 3. Slave Error ACK Time: Stands for Slave no response longer than ACK time, will send SMS to authorized phone numbers. Read Save	
< COM44	>	Device model:BL100 www.BLiiot.com	

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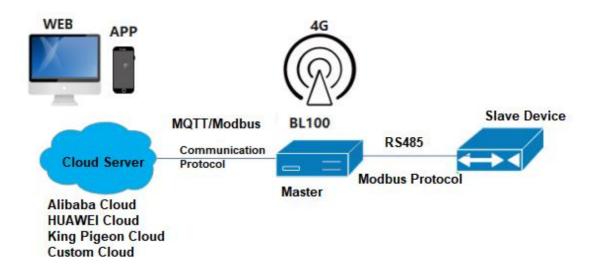


If there are multiple devices connected to RS485 interface, their parameters must be the same as BL100 parameters. For scan rate, timeout and Slave Error ACK Time, it's OK to keep the default setting.

(3) Click below Save button

(4) In configuration software, set cloud communication protocol to Modbus RTU. Other settings refer to <u>4.5.6 Other IOT Platform</u>

## 5.2 Modbus Master and Cloud Connection



BL100 can be connected to cloud platform or SCADA system via cellular network. Users can choose custom platform, King Pigeon Cloud 2.0, King Pigeon Cloud 3.0, Alibaba Cloud and HUAWEI Cloud.

If connecting it to King Pigeon Cloud, just click the selected platform in cellular network setting and enter Login Message (device serial number) provided by BLIIoT sales team. For other part, keep the default settings. Click Save to complete configuration easily.

Users can connect the device to private cloud via Modbus RTU,Modbus TCP and MQTT protocols. Refer to 5.2.5 MQTT Application for MQTT details

### **Cloud Connection Procedure:**

(Step 1 & 2 are common and will not be repeated. Only Step 3 & 4 are different for different platforms.)

Step 1 Set serial port as Modbus Master in Configuration Software

**Step 2 Set Slave Device Datapoint in Configuration Software** 

Step 3 Set Cloud Parameters in Configuration Software





MAKE IIOT EASIER

# 5.2.1 RS485 Serial Port Mode Setting

(1) Set serial	port mode	to Modbus R	TU Master		
MODBUS to MQTT gateway BL100					
🛃 Load Configuration File 🛛 🚽 Expor	Configuration File	actory Reset 🛛 Language 🛛 🗐 A	bout		
Serial Port Slave Mapping List Cellular network setting Self-Check Advanced functions(optio Parameter settings	Channel 1 Mode Mod Baud Rate Close Data Bit Mod	pping Register × Period t Bus RTU Master  Bus RTU Master Bus RTU Slave sparent transmission	imer X Serial Fort X Scan Rate Timeout Slave Error ACK Time	200 (200~65535mS)	
Clock timer Period timer Mapping Register Firmware Update				s than 200mS. ime: Stands for Slave no ın ACK time, will send SMS to	
< >					
COM44		Device Type:	BL100	www.BLiiot.cn	

### (2) Set Slave Datapoint



### Modbus to MQTT Gateway

- BL100

Slave Mapping List	序号 从机地址	数据类型	功能码	寄存器起始地址	映射寄存器数量 映射寄存器起始地址 映射寄存器结束地址 通道
	1				Setting Slave - X
Cellular network set	2				
Self-Check	3 4				
Advanced functions	5				
	6				Slave Serial Number 1
	7				Slave Address (Range 1~254)
	8				Data Type Boolean V OK
	9				Modbus Function Code Boolean Cancel
	10				Word
	11				integer
	12				Wapping Register Qty.
	13				Mapping Register Starting Addr. 64 V
	14				
	15				Tips:
	16				1. Register Starting Addr. : In Slave, from which register address starting to
	2. Select		, right cli	click "Read" butt ck to add mapp	in RTU. 3. Mapping Register Starting Addr. : In RTU, from which register address used to save the mapping register address value. No need to setup the end register address, the RTU will automatically calculate it according to mapping register Qty.
	Hold regis	ter Comma	nd	06 command	4. The Data Type and Modbus Function Code of the mapping registers must
		Coil comr	nand	05 command	✓ modify

Edit slave parameters: •

Right click slave data type to enter setting page. High limit alarm, low limit alarm, alarm SMS content and recovery SMS content can be set. Tick Alarm SMS to enable it.

Stare Editor     -     ×       Cell     Cell     Cell     Cell     Cell     Stare Editor     -     -     ×       Self     Name     Data Type     Ratio     Alarm Verify Time(0~65535)     Threshold high     Threshold low     High Alarm SMS     Low Alarm     Recovery SMS     Enable SMS     Enable SMS	En.			e Mapping L			- I've a service						
Cell         Data Type         Ratio         Alarm Verify Time(0-65535)         Threshold high         High Alarm Inveshold         Low Alarm SMS         Low Alarm SMS         Recovery SMS         Enable Recovery           Adv         Double20256         DATA_DOUBLE_ABCDEFGH         1         2         0         0                  Recovery         Enable SMS         Recovery         Enable SMS         Recovery         Enable Content         Content         SMS         Content         SMS         Recovery         Enable                                                                    <	Slave Manning L	ict	Slav	e Address	Data Type Mod	dbus Function Cod	le Register S	tarting Addr.	Mapping Reg	ister Qty. M			g Addr.
Channel Name         Data Type         Ratio         Alarm Verify Time(0~65333)         Threshold high         Threshold low         Starm S         Content         Content         Content         Content         SMS         Enable SMS           Adv         Double20266         DATA_DOUBLE_ABCDEFGH         1         2         0         0         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         -         <	Cella	tor	_					T 100000 - 10000		CT 40	-	×	
Double20260         DATA_DOUBLE_ABCDEFGH         1         2         0         0         1         1         1         1         2         0         0         1         1         1         1         2         0         0         1         1         1         1         1         2         0         0         1         1         1         2         0         0         1         1         1         1         1         1         2         0         0         1         1         1         2         0         0         1         1         1         2         0         0         1         1         1         2         0         0         1         1         1         1         2         0         0         1         1         1         1         1         2         0         0         1         1 <th1< th="">         1         1         2         0         0         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         <th1< th=""><th>Channel</th><th>Data Type</th><th></th><th>Ratio</th><th></th><th></th><th></th><th>SMS</th><th>SMS</th><th>SMS</th><th>Recovery</th><th>Enal</th><th></th></th1<></th1<>	Channel	Data Type		Ratio				SMS	SMS	SMS	Recovery	Enal	
ouble20264       DATA_DOUBLE_ABCDEFGH ×       1       2       0       0	Advoouble20256	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0						
Couble20268       DATA_DOUBLE_ABCDEFGH       1       2       0       0	Double20260	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0						
Ocubie 20272       DATA_DOUBLE_ABCDEFGH       1       2       0       0	Double20264	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0						
Souble20276         DATA_DOUBLE_ABCDEFGH         1         2         0         0	Pouble20268	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0						
Ocuble20280         DATA_DOUBLE_ABCDEFGH         1         2         0         0	Pouble20272	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0						
Ocubie20284       DATA_DOUBLE_ABCDEFGH       1       2       0       0	Pouble20276	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0						
Ocubie20288       DATA_DOUBLE_ABCDEFGH       1       2       0       0	Double20280	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0						
Double20292       DATA_DOUBLE_ABCDEFGH       1       2       0       0       I       I         Image: Comparison of the second	Double20284	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0						
	Double20288	DATA_DOUBLE_ABCDEFGH	~	(1	2	0	0						
	Double20292	DATA_DOUBLE_ABCDEFGH	~	1	2	0	0						
												- F	-

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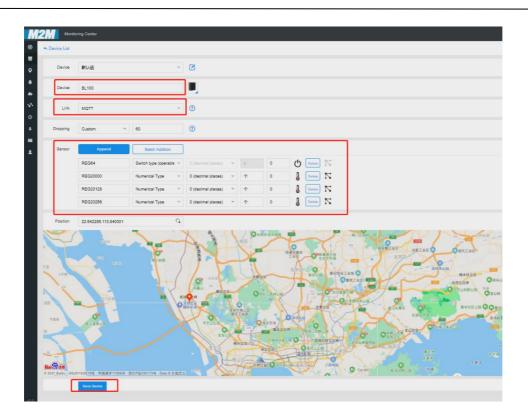
 Once datapoint is set, click mapping register to read datapoint real-time value. Configuration before cloud connection is completed. The following procedure is to configure cloud connection.

# 5.2.2 King Pigeon Cloud Application

	onnection Paran						
IODBUS to MQTT gateway BL	100 Configuration Software V1.0						
and Configuration file 🖣 Ex	port Configuration File 🙀 Factory Re	ort Languager 鼠	About				
G Serial Port	Serial Fort × Callular asteory	setting K					
Slave Mapping List	KPIIOT 2.0	KPIIOT 2.0			Other IOT		
Cellular network settin	KPHOT 3.0 (Modbus)	(MQTT)	HuaWei Clouid	ALI Clould	Server		
Statement of the local division of the local	Cellular Network Settings						
Sell-Check	Communication Protocol		Server	1 IP/DNS modbas	uthuip.com	(Max60)	
Advanced functions(o	Modbus RTU P	oti -	Server L	isten Port 6651	(0-65535)		
Parameter setti	Protocol TCP		Server	2 IP/DNS		(Max60)	
Number setting			Server L	isten Port	(0-65535)		
Clock timer			Heartbea	et Interval 60	(1-9999 5)		
- 1 <del>- 2</del> - 1			No Response	e Resend Times	i v (1-ii)		
- Period timer							
- (Q) Mapping Regis	Pis fill in the login message(devic	e ID of cloudLand cli	ck save	3			
Firmware Upda	Login Message ASCII 🤟		(Max60)	-			
3446	Copin ACK Message ASCH 👻		[Max00]				
	Logout Messarge ASCII -		(Svtax60)				
	Heartbeat Menage ASCII	2	(Max00)				
	Heartbeat ACK Message ASCH -		(Max62)				
	Logis Message Strangy Send One	When Logis Server					
					1		
					4		
					_	_	
						_	
	FAQ for settings please refi	r to [Help] menu		Read	Save		
						_	
2	¢						
4		Device mo	del:BL100	www.B	Lilot.com		
	(+)		C D	ab.			

(4)Set Device Datapoint in Cloud Platform (for datapoint mark REGXXX details, please refer to Appendix 6.2 Mapping Register Address)





Set King Pigeon cloud modbus read & write command

CP Freesont				Contract March						_
(TTP Preside	-	Serial Residen	Second	Reve Address	Puestion Code		Deter Format	Sea the	Ryte Grain	Augu
e #10		100	-	¥	1 Peak and other		-			38
m tor	-		*#12200	11	Class and other	20081	Hilfradios Signati N 👻			20
AGET Protocol	Al Danis			N		1000	and the second s			100
EP Praksiel		(P)	P#030128	$M_{\rm eff}$	Closel and with	21129	SPretton Spred II *		48:00	- 20
CP.SON Presmi		1.4	RECOOM	10 C	Sand pair with -	3057	Gillophon Floating (		48-00 67-04	- 26
Cover Present						-				-
di-hit Postani	1	•								
Intel Presental										
laW Pranatal										
laW Pranacal										
Lakit Pratacal		h								
lafë Prancal		þ								
ayli Pranadi		þ								
of Panet		þ								
akê Parasal		þ								
akê Parasal		þ								
add Prenad		D								
aw Prance		ן								
add Prenad										
off Proses										
aw Pranci		D								
off Protocol		)								

- Slave Address: Set BL100 device ID
- Function Code: select it according to slave type (refer to Appendix 6 Mapping Register Address for details)
- Bias: Add 1 to the address mapped to BL100 register. For example, if BL100 mapping register address is 64, then put 65 in cloud Bias
- Data Format: not necessary to set for boolean data. Select 16-bit, 32-bit, 64-bit data type according to actual status

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- Byte Order: numeric row datapoint sequence (For details, refer to Appendix 6.4 Read Mapping Register Address)
- > Acquisition Cycle: Interval of acquiring slave data

Once above setting is completed, device will be online after a while. Device datapoint status can be viewed from cloud.

Monitoring Center					Cansale 🗘 🖨	English 🌒 🕶
Device name /ID	Q BL100 Se	erial Number: HS765X	N8YV16725Y			500
All Equipment Alarm 🚺 Unline		<b>:G64</b> 1644249	⊈ Connected Updated 2021/08/09 16:03:49		AmQ RT C	rve⊙ Hist Query4-
✓ BUE	1 RE	<b>G20000</b> 1644865		50 ↑ 🛩	Amộ Rĩ c	rve⊙ Hist Query-}-
		6 <b>20128</b> 1695078		60 🛧 🛩	AimQ REQ	rve⊙ Hist Query-}-
BL100		G20256 1695079	Q Connected Updated 2021/08/09 16 (03:58	80 🛧 🛩	Amo, RTG	rve⊙ Hist Query-}-
> 分隔符	00					

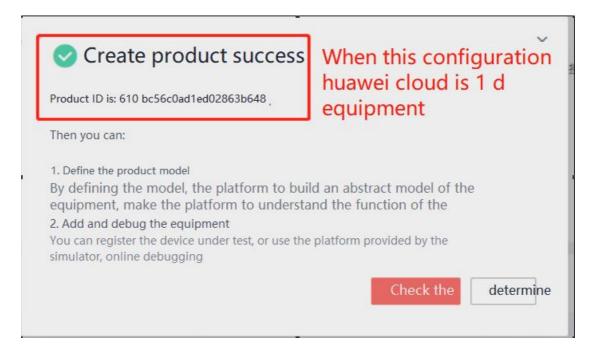
# 5.2.3 HUAWEI Cloud Application

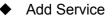
In above part, serial port and slave datapoint have been set. To configure HUAWEI Cloud parameters, it's necessary to create device in HUAWEI Cloud first and get device ID, secret key and service ID. Below is the procedure:

- (1) Create product
- (2) Register device
- (3) Get service ID, device ID and secret key
- (4) Copy service ID, device ID and secret key to configuration software and save it
- (5) Device is online in HUAWEI Cloud
- Create Product



	HUAWEI CLOUD	Console	Reling4		Search	Q Billing Cester	Resources Ser	vice Tickets Enterprise	ICP License Support	English jinge123456	e
≡	IoT Platform		Products							2 Create Pro	duct.
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<ul><li>↓</li><li>●</li><li>●</li></ul>	Resource Spaces IoTDA Instances Documentation API Explorer IoT Device Provisioning		Product Name         Pr           BL100/700         6           BL300R         66           BL30R         67           BL30R         68           BL30R         68           BL30R         68           BL30R         68           BL30R         68           BL30R	* Dala Type * Manufacturer Industry * Device Type Advanced Settings	ISON BELAISHU Defaul RTU RTU Coltom Product (2) Decription	• • •	Cancel	Ровасс Матт Матт Матт		EardRapp.jroge123456.j.         *           Operation         *           View   Delete         *           View   Delete         *           View   Delete         *	C







Close the network platform	The product/8L100			
The vision I	BL100 demonstration ID: 610 bc56c0ad1edo2863b648 register equipment Product name BL100 demonstration device type Gateway device json data type	Add the service	×	
nanagement	Manufacturer's name Iron and steel technology The model   Online ;   Topic management	The service description   XXX	3/128	
Will Mr. And debugging			Basic services	Electricity management services
inan P		the product model: if there is no definition of Custom build	of product model, equipment reported i	The residual voltage electricity is fthe platform offers a variety of ways to define tata platform only forwarded directly, do not do mport   import library model 1

Add Property: set data. Property name starts with REG. Select data type from boolean and numeric data. Property name is datapoint read-write mark. Refer to <u>6.2 Mapping Register Address</u> for details. For example, boolean slave mapping register address is 64, then property name is REG64

HUAWEI CLOUD Consol	tr ♀ Beijing4 →		Search	Q Billing Cente	er Resources Serv	ice Tickets Enterprise	ICP License Support English	jinge123456
IoT Platform	Products / BL100示范							
C Base Edition Default	BL100示范 ID: 610bc56c0ad1ed02863b6488 Reg Product Name BL100示语	intered devices: 1 Resource	Add Property	255 411	Q	×		
Products	Device Type 网天设备	Protocol		REG+ Address o	of the slave reg	ister		
Devices	Data Type json	Created	* Property Name	REGXXX				
	Manufacturer 假锦科技		Description	XXXXX				
Storage Management	X				4/1	28		
A Resource Spaces	Vodel Definition Online Debugging	Topic Management	* rata Type	Integer				
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Documentation	Service List	Service ID BL100 Service ypt	* Value Range	0 -	65535		Modify Serv	ice Delete Service
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toT Device Provisioning ap		Add Property Batch D Property Name	Step			ation	Operation	
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		REG20000		Cancel			Copy   Edit   De	lete
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		Add Command						
IoT Platform		****	n de la composición de					
	Product Name BL100元语	Resource Space	DefaultApp_jinge123456_)	ot				
Basic Edition Default	Device Type 网关设备 Data Type json	Protocol Created	MQTT 2021/08/05 19:03:08 GMT	-03-20				
Overview	Manufacturer 個線科技	C. CONTRA	ava ijugus rassau anir					
Products 1								
Devices •	Model Definition Online Debugging	Topic Management						
Rules •	Add Service Import from Library Import	from Local Import from Excel					Learn About Product M	odels Export
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Resource Spaces		Service ID BL100 Service Type XXX	Description XXX				Modify Service E	elete Service
IoTDA Instances	BL100 3	Add Property Batch Deletion						
Documentation		Property Name	Data Type	Access	s Mode	Description	Operation	
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loT Device Provisioning		REG20000	Integer	Reada		19.5 19.5	Copy   Edit   Delete	
		REG128	Integer	Reada		XXX	Copy Edit Delete	
		REG20256	Integer	Reada	ible	XOX	Copy Edit Delete	

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Website: www.iot-solution.com



Click Device to Register it

****	HUAWEI CLOUD	Console	Deling4			1	Search	٩	Billing Center	Resources	Service	Tickets	Enterprise	ICP License	Support E	English	jinge1234	56   E	9
=	IoT Platform		All Devices	otal: 4 🔎 Activated: 4 🔮 Online: 0											2	2	Individu	al Register	
8	Base Edition Default		Device List	Batch Registration	atch Deletion File Upload	is									Anal	lyze histori	cal datato g	ain insights	
m	Overview				Individual Register						×	All	*	Device Nam	e 👻 Search			Q C	
۲	Devices		Status 🕲	Device Name							t 7			No	de Type	Operatio	n		
0		1	Offline	BL100xx	* Resource Space 🕐	DefaultApp_jin	ge123456_lot			*	7:18			Din	ectly connected	View I	Delete Fri	ieze	
Ø	All Devices 1 Groups		© Offline	BL100R	* Product	BL100示范				٣	2			Din	ectly connected	View ] 1	Delete   Fri	ieze	
Ô	Software/Firmware		Offline	R40	* Node ID	BL100				Ø				Din	ectly connected	View   I	Delete Fri	ieze	
4	Upgrades		© Offline	BL100	A Nobe to	62.100								Dir	ectly connected	View 1	Delete   Fri	eze :	
•	Device CA Certificates		10 7 1	iotal Records: 4 ( 1 )	Device Name	BL100													
۲	Rules	• •			Authentication Type 🛞	Secret	X.509 certificate				Fater 8 to	32 characte	ers. Only letters						
	Storage Management				Secret		Set your ov	vn pas	ssword		numbers, h are allower	typhens (-) d. (Due to)	, and undersco protocol restrict must be an ev	res (_) tions,					
	05M .	*			Confirm Secret						number of			en					
	Resource Spaces				Contiern Secret									_					
	IoTDA Instances						OK Cancel												
	Documentation	a.																	
	API Explorer	ď																	
	IoT Device Provisioning	2																	C

 Click OK to confirm it. Device Register Success notice box will pop out. Save below password and product ID

HUAND	HUAWEI CLOUD				e [®]
11 @	IoT Platform	All Devices Total: 5 • Activated: 4 • Online	-0	Individual Register	
9 4 2 9 0 0 4 0 0	Extraction Debut Oversiter Products Devices All Devices Group Software/Fermione Upgrades Device CA Certificates Rules	Device List         Batch Registration           Status         Device Name           Inactive         BL100X           Offline         BL00X           Offline         BL00X           Offline         BL00X           Offline         BL00X           Offline         BL00X           Offline         BL00X           Offline         RL00X	Detection         X           Concentration         A solution of the following device information, which you can use to action to device.         Concentration of the following device information, which you can use to action of the device information, which you can use to action the device information.         Concentration of the device information, which you can use to action the device information, which you can use to action the device information.         Concentration of the device information, which you can use to action the device information, which you can use the action of the device information.	Analyze hotorical datato gam mergin All  Device have  Search Q Opencion Recording Device y connected Very Device Prese Record Record Recor	
	Storage Management D&M • Resource Spaces IoTDA Instances Documentation API Explorer IoT Device Provisioning		Save the device D and password for setting platform param	eters	

 Copy above device ID and secret and copy it to configuration software as below picture. Service ID is the same one that created in HUAWEI Cloud.



Serial Port	Serial Piet × Callular nateors setting
Slave Mapping List	KPHOT 3.0 (Modbut) (MQTT) HawWei Clouid ALI Clouid Server
Cellular network setts	Cellular Network Settings
Self-Check	Communication Protocol
Advanced functions(o	HuaWei Cloud
Advanced functionejo	
Parameter setti	Protocol TCP
Number setting	Region North China(Br v
346	Heartbeat Interview 100 (19999 S)
Clock timer	No Response Resend Times 3 - (1-9)
Period timer	
*	
Mapping Regis	
Firmware Upda	Authentication Method Device Serec -
201	Device ID 011a12fb2cc, 2860960e0_BL
	Secret Key 1234 99
	enice ID BL100
	Publish Period(S) (80 (10-63535 5)
	Device Certificate Update
	Device Private Kay
	MQTT Data retransmission 🔲 Enable / disable
	FAQ for settings please refer to (Help) monu Read Save

 Once configuration is done, wait for device to be online. Once it's activated, data can be viewed by clicking property

HUAWEI CLOUD Console	♥ Belling4 ・		Search Q	Billing Center Resources S	ervice Tickets Enterprise	ICP License Support English jinge123456
IoT Platform						
	Product Name BL100示范	Resource Space	DefaultApp_jinge123456_iot			
Basic Edition Default	Device Type 网关设备	Protocol	MQTT			
Overview	Data Type Json	Created	2021/08/05 19:03:08 GMT+08:00			
Products	Manufacturer EIRE439					
Devices •	Model Definition Online Debugging	Topic Management				
Rules 👻						
Storage Management	Add Service Import from Library Import	rt from Local Import from Excel				Learn About Product Models Expl
08M • •	Service List	Service ID 8L100 Service Type XXX	Description, XXX			Modify Service Delete Service
Resource Spaces		Server Server Server type and	Description and			monty service in protect service
IoTDA Instances	BL100	Add Property Batch Deletion	3			
Documentation of		Property Name	Data Type	Access Mode	Description	Operation
		REG64	Integer	Readable, Writable	风度	Copy Edit Delete
API Explorer @		REG20000	Integer	Readable	L.R	Copy Edit Delete
IoT Device Provisioning P		REG128	Integer	Readable	2001	Copy Edit Delete
		REG20256	Integer	Readable	XOX	Copy   Edit   Delete
		10  Total Records: 4 (1)				
		Add Command				
		Command Name	Command Parameters	Response F	Parameters	Operation
				!		
				Q		

 Click Device-Device Debugging to view detailed device data sending and receiving.

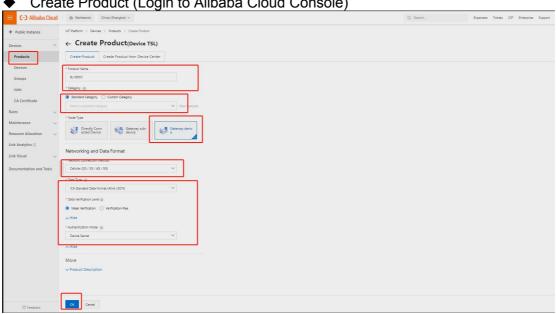


ServiceCommand	ent Command Delevery	Col lot Platform		Message Tracing	' «Sho
	Service Command	Service   Service   Delivery  Data  Delivery  Data  Delivery  Data  Delivery  Data  Delivery  Data  Delivery  Delivery Delivery Delivery	Command Data Reporting Command Delivery Command Delivery Command Delivery Command Delivery Command Delivery Command Delivery Command Delivery	Service  Command  Com	Service  Command Comma

## 5.2.4 Alibaba Cloud Application

As stated above, serial port mode and slave device datapoint are set. It will not be repeated here. Before configuring Alibaba Cloud, it's necessary to create product in Alibaba cloud, add device and get device certificate, which is similar to configuring HUAWEI Cloud.

Step: Create product-Add Device-Get Certificate-Create Alibaba Cloud Data Point-Publish Device-Set Cloud Connection in Configuration Software-View Device in Cloud



Create Product (Login to Alibaba Cloud Console) ٠



### Modbus to MQTT Gateway

- BL100

3 C - ali cloud workber	nch 2 east Chin	a (Shanghai),	Qq search	) cost
Please public instance	New features, t	he 2021-07-30 announcement: the Internet of things platform release	el Check details	
Equipment management 🔨		things platform/product management/create products		
product	- to cre	ate products		
equipment			You have successfully complete	ted to create products
grouping			then you can:	ted to create products,
task	<b>S</b> +	Add equipment		
The CA certificate		Device belonging to a product specific equipment, under the Internet of things platforr platform, can also be used as a device through the gateway connecting Internet platfor		nected directly to the Internet of things
The rule engine $\checkmark$		To add		
Monitor the operationa	al eye	For the product definition model		
Equipment classified 🔍		lot platform support for the product definition model, the actual p management and data interaction. After completion of product cr		
The data analysis of concave		ini To define the model		and device with determinationly
Video service 🗸 🗸				
Documentation and tools			Straight see th Returns the list of pr	roducts

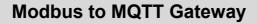
•	Add	Device
•	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	00000

😑 C-C Alibaba Clou	d	😂 Workbench China (Shanghai) Y				Expenses Tickets	ICP Enterprise Support App 🖾 🗘 🗑 🕻
← Public Instance		IoT Platform / Devices / Devices					
Devices		Devices					
Products		All 🗸	Total Devices @ 2	Activated Devices	• Online @ 0		
Devices		Device List Batch Management					
Groups		Add Device: Batch Add DeviceN		Add Device	×		
Jobs		DeviceNeme/Alias	Product Noc	Note: You do not need to specify DeviceNa specified, Alibaba Cloud will issue a unique			Actions
CA Certificate		BL100xx	84,100x Gate	as DeviceName.	12	10-56.883	View Delete Sub-device(0)
		BL100SDEVICE	[	Products BL100xx		18.17.276	
Resource Allocation			BL100 Sati	DeviceName		16:17.270	View Deleta Sub-device(0)
Link Analytics 🗈				X000X			
Link Visual				Alias D			
Documentation and Tools			بار				
					OK Cancel		

 Once device is added successfully, it can be viewed in console by clicking view. Click Copy to save it on desktop for following configuration

E C-J Alibaba Cloud	& Workbench Chi	ina (Shanghai) 👻				Expenses Tickets ICP	Enterprise Support App 🖾 🎝 👾 🕜 El
← Public Instance	IoT Platform / Devices /	Devices / Device Details					
Devices ^	← BL100xx	Offline					
Products		ho: View ShKJEJV Copy		DesiceServ	View		
Devices			ice Shadow Manage Files	Device Log Online Debug Sub-device	e Management Groups	Task	
Groups	Device Information		Device Certificate		×		
Jobs			Device Certificate Copy	/			
CA Certificate	Product Name	BL100xx	ProductKey	a1TVShKjEJV Copy		Region	China (Shanghai)
Rules ~	Node Type	Gateway	Productively			Authentication Mode	Device Secret
Resource Allocation	Alias 🔘	示例復示 Edit	DeviceName	BL100xx Copy		Firmware Version	
Link Analytics IS	Created At	Aug 6, 2021, 11:19:37	DeviceSecret	8f7e3d6b741065b8023c1e15bd3ce25b Copy		Last Online	Aug 9, 2021, 09:10:56.883
Link Visual 🗸 🗸	Current Status	Offline	Certificate Installation M		_	Device local log reporting	Disabled
Documentation and Tools	More Device Informatio		✓ Introduction to the unique-	certificate-per-device and unique-certificate-per-product	modes		
					Close		
	SDK Language		Ve.	-		Module Manufacturer	
	Module Information						
	Tag Information	🖌 Edit					
	Device Tag: No results found						

Shenzhen Beilai Technology Co., Ltd.





- Create Data Point
- Product--Device--Add Self-defined Features
- Feature Name: Custom set it, like fan, light, temperature, light intensity, etc
- Identifier: REG (XXX), put the corresponding mapping register according to datapoint to be added. Refer to <u>6.2 Mapping Register Address</u> for more details. For example, boolean slave mapping register address is 64, then identifier is "REG64"
- > Data Type: Boolean, Numeric, select it from drop-down menu.
- Read/Write Type: Tick Read/Write or Read-only according to actual status
- > Description: provide any necessary description, can be blank

	IoT Platform / Devices / Produ						
Public Instance		icts / Product Details					
vices ^	← BL100xx						Publ
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Devices							
āroups	Product Information Top	pic Categories Define Feat	ture Data Parsing Server-side Subscrip	tion Device Provisioning			
obs	What is currently displayed is	s the function definition that has bee	en posted online. If you need to change it, please clic :	Edit Draft			
A Certificate	TSL Model Build device-si	de code					
s v	Enter a module name Q	Default Module					
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ource Allocation 🗸 🗸	Default Module	Properties	AAA (Custom)	REG20128	Int32	Value Range: 0 ~ 65535	View
Analytics 🖸		Properties			intere.		view
Visual 🗸 🗸		Properties	CCC (Custom)	REG20256	Double	Value Range: 0 ~ 65535	View
umentation and Tools						Boolean value: 0 - 关	
		Properties	Rutt Custom	REG64	Boolean	1-开	View
				GeoLocation	Struct		
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• Set Cloud Connection in Configuration Software: Copy the data saved on desktop and paste it in configuration software. It can be viewed from Alibaba cloud device view page as well.

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Enter above parameter in configuration software and click save to complete it. Return to Alibaba cloud and wait for device to be online

Slave Mapping List		KOUOT 2.0	KOUOT 2.0		-	01 107
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Number setting				Heartbeat	t Interval 60	(1-9999 S)
Clock timer				No Response	e Resend Times 3	~ (1-9)
Period timer						
Mapping Regis						
	Authentication M	ethod Device Ser				
Firmware Upda	Product Priva	te Key	220			
	Device	Name		7		
	Device Priva	te Key		7		
	Pablish Per	iod(S) 60	(10 65535 5)			
	MQTT Data retrans	mission 🗌 Enab	le / disable			
				1		
	FAQ for set	tings please refer t	to [Help] menu		Read	Save

 Before device is online, it's inactivated. Once it's connected successfully, the status will be online like below picture.

O E cloud work in eas	t China (Shanghai) 2 v			Qq sear	:h	Charge the repair order ICP chamber enterprises
← ^p ublic instance	The 02021-07-30 announcement: the Internew features! See the mood	rnet of things platform releas	ed			
equipment management	The Internet of things platform/facilities					
product	equipment	Equipment number 0	. the activation device	, the current online 0		
equipment	All the products	1	<ul> <li>the activation device</li> <li>1</li> </ul>	, the current online		
grouping	Batch management advanced searc	h L				
task	Add a flu Batch adding DeviceName	Please enter the DeviceNa	me Please	select a device label v		
The CAscertificate	Mouth DeviceName/children's name	Not for their products	Node clasaj	State/enable jie mouth	The last time online	operatio
jSee the _E pu 🗸 🗸	BL10OSDEVICE all cloud testing	BL100	The gateway	, online	2021/08/04 18:18:17-27	6 Children
Monitor the operational-						watch
Ops the market	< Peng 1 with enable					
Online debugging						
Equipment simulator						
The log service						
OTA upgrade						
Remote configuration						

Data point read-and-write can be performed in device online debug page.

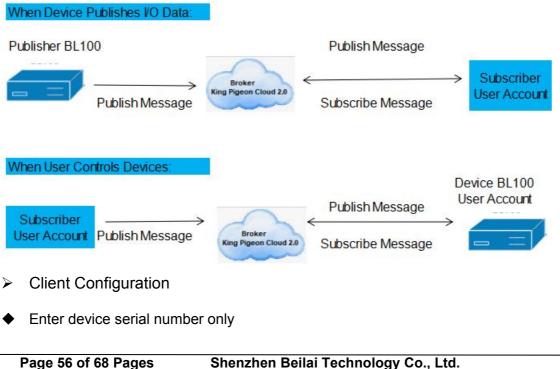


Public Instance	Online Debug				
vices	Select device: BL100xx × BL100xx ×				
intenance	Online debugging only supports debugging real equipment, please use virtual equipment debugging	E X Device simulator	Real-time Logs	Auto-Refresh 🔘 C	늡
			Time	Content	
Real-time Monitoring Dashboard	Property Debugging Service Calls Remote Login Module: Default Module		TSL Aug 9, 2021, 17:18:52:558	["Status" ("Sets" ("Instanced" Viole-public", "Paramit"), "REG64111, "REG20000-1500, "SET0 VINT100, VIEC20128, "600, VIEC20258," 600, "Time" 22 21-04-09 Th 182328," ("Operation"), "Carder "Vicas", "Status", "Tala para teacher", "Lacif and "Vicas", "Addition and "Vicas", "Status", "Tala para teacher, "Vicas", "Status", "Vicas", "Vicas", "Status", "Vicas", Vicas", Vicas", Vicas", Vicas, Vicas", Vicas, V	
Online Debug	地理位置(Latitude) ③	*		ceName': "BL100xx", "Messageld": ")	
Device Simulation	Enter a parameter (double) 화理位툴(Altitude)		物模型消息 Aug 9, 2021, 17:18:52:553	["Statu": "the "Instanced" in the public "Paramet" "Time" 12821-86.96 17:16.52.533 "Operation" / typis11756/56/WB.100.ohting/event ont" Code" 2007 "Resond" 'Uncerte "2021-86.69 (This 52:53-6600") reformation" / typis11756/56/WB.100.ohting/event 766582007254687450239" (Production / These) The Statistical Code "ThingModelMessage" "DeviceName" '18L100.ohting/event 732801	
OTA Update	Enter a parameter (double)	- 1	L	37200 }	H
Remote Config	と 地理位置(CoordinateSystem)				
Alert Center	Please select a parameter (enum)				
ource Allocation V	风躕(REG64)				
Analytics 🖸	开-1 ×	Debugging 🗸			
Visual 🗸	CCC(REG20256)				
umentation and Tools	80.0	Debugging 🗸			
	AAA(REG20128)				
	70	Debugging 🗸			

## 5.2.5 MQTT Application

### **MQTT Principle**

There're 3 roles in MQTT protocols: Pulisher, Broker(Server) and Subscriber. Message publisher and subscriber are client. Message broker is server. Publisher can be subscriber at the same time. Below is the example of connecting BL100 to King Pigeon Cloud 2.0:



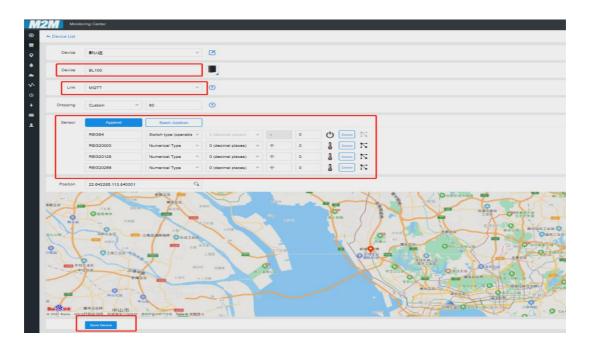


### Modbus to MQTT Gateway

- BL100

Serial Port	Serial Pert ×	Callular nateork satt	ing 😹						
Cellular network setti	KPINOT 3.0	KPIIOT 2.0 (Modbus)	KPHOT 2.0 (MQTT)	HuaWei Clould	ALI Clould	Other IOT Server			
	Cellular Network Se	rtlings							
Self-Check	Communication	Protocol		Server	1 IP/DNS regituits	ipucoim	(Max60)		
Advanced functions(o		MQTT Protocol		Server L	isten Port 1883	(0-65535)			
Parameter setti	Protocol	TCP		Server	2 IP/DNE		(Max60)		
1 😹 👘				Server L	isten Port	(0-65535)			
Number setting				Heartber	t Interval 00	(1-9999 5)			
Clock timer				No Respons	e Resend Times 3	~ (1-9)			
Period timer				0.000		1000			
*					MQTT Settings				
Mapping Regis									
- G Firmware Upda					Subscribe Topi				
					Publish Topi			-	
					MQTT Client II	D			
					MOTT User Nam	MQTT .			
					MQTT Passwor	A MOTTEN			
					Publish Period(5		0-65535 5)		
						And a second second			
						promission 🗆 Enab			
					Tips: Only use	MQTT Protocol requ	ire to setup.		
							_		
	FAQ for se	ttings please refer to	(Help) meta		Read	Save			
	6								

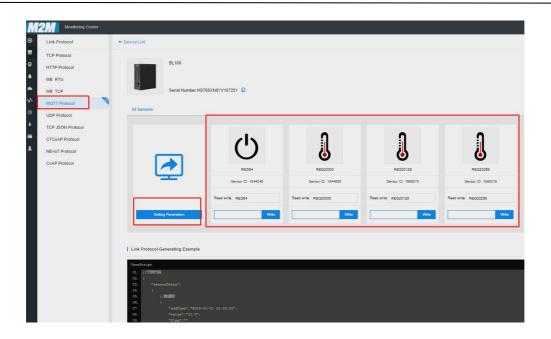
• Create device and data point in King Pigeon Cloud



 Read-Write identifier setting. Slave identifier starts with REG plus mapping register. Refer to <u>6.2 Mapping Register Address</u> for details

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Data View and Dissemination

Device name //D All Equipment Alam ① Unline 学 就社组 ② R46 ③ S270 ③ BL100		00 🖵 connected	BULL ON OFF	ON
<ul> <li>         ・ 新礼経営         ・         ・         ・</li></ul>	1/7 ID:16442	49 Updated:2021-08-09 1€ 20 ♀ connected	BULL ON OFF	ON
R40	REG2000			
			:07:44	50 🛧 🛩
BL100	REG2012 ID:16950		:07:44	60 🛧 🛩
M161	REG2025	79 Undated 2021-08-0	ata Dissemination — 🕅	° <b>∩</b>
<b>三</b> 共进模块475测试		10		*
<ul> <li>EC200傑夫澳航5208E</li> <li>R10源流</li> </ul>				
> 分隔符				
Valid Pavload	Data Forma	at in Device Pul	olishing Messag	1e
ublishing Topic: Se			·	
{		•		
"sensorDatas": [				
{		-		
	Boolean valu	e Read-Write Identif	ior	
		ype and Value		
},		Jpo ana valuo		
{ ,,				
`//Nume	ric Type			
		//Read-Write Iden	tifier	
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### "value": 30 //Data Type and Value

1.

}

"state":"alarm", //Alarm Identifier (Only exist when Alarm & Event is configured and alarm is triggered. It's not included in scheduled regular reporting) "state":"recovery", //Alarm Recover Identifier (Only exist when there's alarm recovery. It's not included in scheduled regular reporting)

"time": "1622700769", //**Time Identifier**, timestamp of data publishing "retransmit": "enable" //**Re-transmission Identifier** (only exist when there's historical data re-transmission. It's not included in scheduled regular reporting)

Note:

//Read-Write Identifier: character is"flag", followed by datapoint MQTT identifier, (The same MQTT identifier set in adding datapoint, can be customized) //Data Type and Value: can be categorized as below:

1.Boolean data: character is "switcher", followed by "0" or "1" (0 is open, 1 is closed)2. Numeric Data: Character is "value", followed by actual value

//Alarm, Recovery Identifier: character is "state", followed by "alarm" or "recovery" (alarm is alarm data, recovery is alarm recovery data)

//Time identifier: character is "time", followed by actual timestamp of data reporting

//Re-transmission Identifier: character is "retransmit", followed by "enable"

Device offline data will be saved temporarily. Once network resumes, it will be re-transmitted. Identifier "retransmit" refers to historical data (need to be enabled in configuration software)

### • Valid Payload Data Format in Device Subscribing Message

Subscribe Topic: Device Serial Number/+ (same as the subscribe topic in configuration software)

(King Pigeon Cloud 2.0 use "device serial number/sensor ID" as publishing topic. Thus Subscribe Topic must add wildcard character /+ to realize device control from cloud

```
{
    "sensorDatas":
    [
        {
            "sensorsId": 211267, //Cloud Senor ID
            "switcher":1, //Data Type and Value
            "flag":"REG65" //Read-Write Identifier
        }
    ],
    "down":"down" //Cloud Downlink Message Identifier
}
```

Note:

//Cloud Sensor ID: character is "sensorsID", followed by ID number (ID is generated by cloud automatically. Ignore this part for selt-built cloud platform) //Data Type and Value. Can be categorized as below:

1. Digital Data: character is "switcher", followed by "0" or "1" (0 is open, 1 is closed)

2. Numeric Data: character is "value", followed by actual value

//Read-Write Identifier: character is "flag", followed by datapoint MQTT identifier

//Cloud Downlink Message Identifier: character is "down", followed by "down", it's cloud mapping register slave mapping address identifier

Item Name	MQTT Read-Write Identifier	Data Type
Boolean Data Type	REG64~127	Switcher
16-bit Data Type	REG20000~20127	Value
32-bit Data Type	REG20128~20254	Value
64-bit Data Type	REG20256~20508	Value

## 5.2.6 Self-Defined Cloud Platform

BL100 supports customer self-defined cloud platform with Modbus RTU, Modbus TCP and MQTT protocol.

Custom MQTT protocol data format is the same as King Pigeon Cloud 2.0 MQTT data format. Refer to <u>5.2.5 MQTT Application</u> for more details. Modbus RTU and Modbus TCP are standard Modbus protocols. Refer to Appendix 6.3, 6.4 and 6.5 for message data details.

Operation Procedure is the same as above:

- (1) configure serial port mode
- (2) Create slave device datapoint
- (3) Configure self-defined cloud platform parameters Refer to below picture
- Cellular Network Setting- Select Other IOT Server-Select Communication Protocol-Enter Server IP/Domain Name and port number. Click Save.

MODBUS to MQTT gateway BL	sport Configuration File 📲 Factory Reset Language 🌒 About		×
Serial Port	Seriel Port X Cellular network setting X Self-Check X		
Slave Mapping List	KPIIOT 3.0 KPIIOT 2.0 KPIIOT 2.0 HuaWei Clould ALi Clould Other IOT (Modbus) (MQTT) Server		^
Cellular network setti	Cellular Network Settings		
Self-Check	Communication Protocol Server 1 IP/DINS mqtt.dtuip.com (Max60)		
Advanced functions(o	MQTT Protocol V Server Listen Pdrt 1883 (0-65535)		
🛛 🧑 Parameter setti	Modbus RTU Protoco		
Number setting	Modbus TCP Protocol Server Listen Port 0 (0-65535)		
Clock timer	HuaWei Cloud		
Period timer	ALi Cloud No Response Resend Times 3 (1-9)		
Mapping Regis	MQTT Settings		
*	Subscribe Topic		
Firmware Upda	Publish Topic		
	MQTT Client ID		
	MQTT Password MQTTPW		
	Publish Period(S) 60 (10-65535 S)		
	MQTT Data retransmission 🗌 Enable / disable		
	Tips: Only use MQTT Protocol require to setup.		
	FAQ for settings please refer to [Help] menu Read Save		
< >	<	_	×
COM52	Device Type:BL100 www.BLijot.cn		 

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Modbus to MQTT Gateway



## 6 Appendix Register Address

## 6.1 BL100 Device Register Address

Hold Register Type, Read-Write, support function code 03

Register Address		Data Name	Data Tuna	Description(1)	
Hexadecimal	Decimal	Data Name	Data Type	Description	
22A	554	Signal Value	16bit int	Y=X	

Input Register Type, Read-Only, support function code 04

Register Address		Data Name	Data Typo	Description [®]	
Hexadecimal	Decimal	Data Name	Data Type	Description	
0	0	Power Supply Voltage	16bit int	Y=X/100	

## 6.2 Mapping Register Address

Note: expanded I/O identifier is: "REGx"(x is Modbus register address)

Mapping Register Address		Data Name	Read-Write Identifier	Data Type	Description [®]		
Hexadecimal	Decimal		Identinei	Type	Boolean bit		
40	64	Bool 64	REG64	Bool	Boolean bit		
41	65	Bool 65	REG65	Bool	type,can map		
42	66	Bool 66	REG66	Bool	slave input coil		
				Bool	and hold coil		
				Bool	status. Total 64		
7F	127	Bool 127	REG127	Bool	addresses		

ning register address hold sail function and 01/0E/1E

16-bit data type slave mapping register address: hold register, Read-Write, support function code 03/06/16

Mapping Regi Address	Mapping Register Address		Read-Write	Data Type	Description
Hexadecimal	Decimal		Identifier		
4E 20	20000	16-bit data 20000	REG20000		Set mapping rule according to
4E 21	20001	16-bit data 20001	REG20001	Order AB, actual data type	configuration software. Data order
4E 22	20002	16-bit data 20002	REG20002	is decided by slave mapped	is AB and saved in the address for
				data	Read-Write in cloud. Can map slave input
					register and hold

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·	1			 
4E 9F	20127	16-bit data 20127	REG20127	register. Total 128 addresses

 32-bit data type slave mapping register address: hold register, Read-Write, support function code 03/06/16

Mapping Registe	Mapping Register Address		Read-Write	Data Tuna	Description	
Hexadecimal	Decimal	Data Name	Identifier	Data Type	Description	
4E A0	20128	32-bit data 20128	REG20128		Set mapping rule	
4E A2	20130	32-bit data 20130	REG20130	Order ABCD,	according to configuration	
4E A4	20132	32-bit data 20132	REG20132	actual data type is	software. Data order is ABCD	
				decided by	and saved in the	
				slave mapped data	address for Read-Write in	
4F 1E	20254	32-bit data 20254	REG20254		cloud. Total 64 addresses.	

♦ 64-bit data type slave mapping register address: hold register, Read-Write, support function code 03/06/16

Mapping Regis	Mapping Register Address		Read-Write	Data Type	Description
Hexadecimal	Decimal	Data Name	Identifier		Description
4F 20	20256	64-bit data 20256	REG20256		Set mapping rule according to
4F 24	20260	64-bit data 20260	REG20260		configuration
4F 28	20264	64-bit data 20264	REG20264	Order ABCDEFG	software. Data order is
				H, actual	ABCDEFGH and
				data type is decided by	saved in the address for
50 1C	20508	64-bit data 20508	REG20508	slave mapped data	Read-Write in cloud. Can map slave input and hold register. Total 64 addresses

### 6.3 Edit Boolean Mapping Address Data

If it's necessary to control relay connected to RS485 slave, function code 15 for slave writing must be added in slave list of configuration software. Once mapping address is changed, RS485 slave address data will be written accordingly.

Message Forma	<ul> <li>Message Format from Master Station</li> </ul>					
Message Content	Byte Qty	Data Example	Des			

Message Content	Byte Qty	Example	Description
Device Address	1	01H	Device 01H , range: 1-247, follow the set

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			address
Function	1	05H	Write single hold coil, use function code 05H
Boolean Mapping Register Address	2	00 40H	Range 00 40H-00 7FH, refer to <u>Appendix B Mapping Register</u> <u>Address</u> for details.
Written Value	2	FF 00H	Value is FF 00H or 00 00H. FF 00H is writing 1, 00 00H is writing 0
16 CRC Check	2	8D EEH	CRC0 CRC1 low byte is in front of high byte

#### Returned Message Format from device:

Content	Byte	Data Example	Description
Device Address	1	01H	Device 01H, same address as received
Function	1	05H	Write single hold coil
Boolean Mapping Register Address	2	00 40H	Range: 0040H-007FH
Written Value	2	FF 00H	Value is FF 00H or 00 00H. FF 00H is writing 1, 00 00H is writing 0
16 CRC Check	2	8D EEH	CRC0 CRC1 low byte is in front of high byte

 Example: change value of Boolean mapping address 64, change it to 1: Server sends: 01 05 00 40 FF 00 8D EE Note:

01: Device Address

05: Write Boolean value

- 00 40: Mapping Address of value to be changed
- FF 00: Write 1

8D EE : 16-bit CRC check

Device Returns: 01 05 00 40 FF 00 8D EE

Note:

01: Device Address

05: Write Boolean Value

00 40: Mapping Address to write value

FF 00: Write 1

8D EE : 16-bit CRC Check

If more values to be changed, please refer to details of function code 15 in Modbus protocol.

### 6.4 Read Numeric Mapping Address Data

	▼ Message i offici field of ver Master.					
Content	Byte	Data Example	Description			
Device Address	1	01H	Device 01H, Range 1-247, same as the set address			
Function Code	1 03H Read hold register, use function code 03					
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Message Format from Server Master:

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Starting Address of Mapping Register	2	4E 20H	Numeric data mapping address range,refer to <u>Appendix B Mapping</u> <u>Register Address</u> for details
Qty of Mapping Registers to be Read	2	00 0AH	Qty of input registers to be read
16 CRC Check	2	3D 2FH	CRC0 CRC1 low byte is in front of high byte

#### • Return Message Format from Device

Content	Byte	Data Example	Description
Device Address	1	01H	Device 01H, same device ID as that in
Device Address	I	0111	received message
Function Code	1	03H	Read hold register
Return Data Byte	1	14H	
		00 14 00 1E 00	
Return Data	20	28 00 32 00 4B	Return data
Retuin Data	20	00 41 00 0A 00	Return uata
		25 00 14 00 2AH	
16 CRC Check	2	FB 34H	CRC0 CRC1 low byte is in front of high byte

• Example: mapping address starts with 20000 and read 10 addresses data:

Server sends: 01 03 4E 20 00 0A D3 2F

Note:

- 01: Device Address
- 03: Read hold register
- 4E 20: Starting address of mapping register, current data is decimal 20000
- 00 0A: Read 10 registers' value
- D3 2F: 16 -bit CRC check

Device returns: 01 03 14 00 14 00 1E 00 28 00 32 00 4B 00 41 00 0A 00 25 00 14 00 2A FB 34

Note:

01: Device Address

03: Read hold register

14: Return 20 bytes

00 14 00 1E 00 28 00 32 00 4B 00 41 00 0A 00 25 00 14 00 2A; Return data

Mapping Register Address	20009	20008	20007	20006	20005	20004	20003	20002	20001	20000
Value	00 2A	00 14	00 25	00 0A	00 41	00 4B	00 32	00 28	00 1E	00 14

FB 34 : 16 -bit CRC Check

### 6.5 Edit Numeric Mapping Address Data

To change data of slave device connected through RS485, it's necessary to add read-write function code 16 in slave list of configuration software. Once mapping



address value is changed, the corresponding address data of slave connected through RS485 will be changed accordingly

For example, mapping address is 20000 and slave mapping data is signed integer type and order is AB

Content	Byte	Data Example	Description
Device Address	1	01H	Device 01H, range: 1-247, same as the set address
Function Code	1	06H	Write single hold register, use function code 06
Mapping Register Address	2	4E 20H	Address range: 4E 20H-50 1CH, refer to <u>Appendix</u> <u>6.2 Mapping Register Address</u> for details of mapped data address range
Written Data	2	00 64H	Data example, write decimal data value 100
16 CRC Check	2	9E C3H	CRC0 CRC1 low byte is in front of high byte

### Message Format from Sever Master Station:

Return Message Format from Device:

Content	Byte	Data Example	Description
Device Address	1	01H	Device 01H, same as the address in
			received message
Function Code	1	06H	Write single hold register
Mapping Register Address	2	4E 20H	Address range: 4E20H-501CH
Written Data	2	00 64H	Write 100 successfully
16 CRC Check	2	9E C3H	CRC0 CRC1 low byte is in front of high byte

 Example: if mapping address is 20000 and slave mapping data is signed integer type with AB order, change mapping address 20000 value to 100:

Server sends: 01 06 4E 20 00 64 9E C3

- Note:
- 01: Device Address
- 06: Change single hold register value
- 4E 20: Change value of register address 20000 register
- 00 64: Write decimal value 100
- 9E C3: 16-bit CRC check

Device returns: 01 06 4E 20 00 64 9E C3

- Note:
- 01: Device Address
- 06: Change single hold register value
- 4E 20: Change value of register address 20000
- 00 64: Change to decimal value 100
- 9E C3 : 16 -bit CRC check

To change more numeric data type mapping address, please refer to details of function code 16 in Modbus protocol



## 6.6 SMS Function

BL100 support remote configuration, inquiry and control with SMS. Below are the notice points:

- 1. Default device password is 1234. It can be changed with SMS for safety
- 2. Password in SMS commands refers to device password, for example if device password is 1234, directly enter 1234
- 3. "+" in SMS commands means plus without any content, please don't add any space
- or character
- 4. Capital and lower case letters must be clarified. For example, PWD should be not be entered as pwd
- 5. If password is correct but command is wrong, device will return message: Wrong

command format, please confirm! Thus please check inputting method, capital and

lower case letters

- 6. If device password is wrong, there will be no message returned.
- 7. Device will return message once it receives SMS commands. If no return message, please check whether password is wrong or network signal is not good.

## 6.6.1 SMS Commands

#### **Change Password**

Action	Command	Return Message
Change	Old password+P+new password	This is new password,
Password		please remember!

#### Arm/Disarm

Action	Command	Return Message
Arm	password+AA	Armed
Disarm	password+BB	Disarmed

#### Inquire Device Status

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Action	Command	Return Message
		Arm/Disarm: xxx
Inquire		Model: xxx
Device	password+EE	Version: xxx
Status		IMEI: xxx
		GSM signal value: xxx

### Set User Number

Action	Command	Return Message	
Set User	password+A+number+T+user number	Telx:	
Number	Number: 0~9		
Inquire	password+A	Return all user numbers	
Delete	password+A+number	Return number 0~4 and 5~9	

### Set Server (Cellular Network)

Action	Command	Return Message
Set Server	password+IP+IP address+P+port number	Server:
Inquire	password+IP	Port:
Delete	password+IPDEL	i on.

#### **Set Cellular Network Parameters**

Action	Command	Return Message
Set	password+AP+APN+#+user name+#+user password	APN:
Inquire	password+AP	User Name:
Delete	password+APDEL	Password:

#### **Reboot Device**

Action	Command	Return Message
Reboot Device	password+Reboot	No return message

Note: There will be no return message for rebooting device with SMS. Tick Alarm automatically when power on in configuration software. Once device is rebooted successfully, SMS will be sent to user



# 7 After-Sale Service

# 7.1 Firmware Upgrading

This device has modular design. If telecommunication operators upgrade network, it's not necessary to change the whole hardware but only communication modules.

It supports firmware upgrading through USB interface. If any new requirement for firmware upgrading, please contact us directly.

# 7.2 Warranty Term

This device has one-year warranty from the day of purchase for any quality problems. Any faulty caused by human damage or wrong operations is beyond warranty

## 7.3 Technical Support

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