# the IOT Controller

(USR-IOT1) (USR-IOT2)

File version: V1.0.5



Jinan USR IOT Technology Limited. works on LAN and WAN and wireless for IOT and Serial to Ethernet Solutions, Ethernet, WIFI, GPRS, and Wireless modules, we can supply custom design for those usage, looking forward to cooperate with you.



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## 1. Introduction

## 1.1. Overview

The USR-IOT1 is a central control unit for intelligent home. Hardware form is an core board and have many kinds of interfaces such as IO, PWM, self-definiable webpages, sensor device(not support for now), Serial to ethernet.

You can use common tcp or udp way to send control command, or use webpages to send data to uart or reveice data, handle IO etc.

Keywords:

IOT Ethernet IO webpage

### 1.2 Features

- Up to 24 channel configurable IO, 3.3V TTL
- Up to 2 channel PWM
- 2 channel Serial to Ethernet Port, can set COM port and working mode independently, work
- Built-in webpages with language CN and EN
- Support user-defined webpages
- Support WEB IO
- Support WEB Uart
- Free setup softuare
- Support USR sensor node(USR-WSD, Modbus protocol)
- New Cortex-M3 kernel, industrial working temperature range, elaborate optimization LWIP protocol stack, stable and reliable.
- Serial port support RTS/CTS hardware flow control.
- Auto-MDI/MIDX function, discretionarily connect cross-over or direct network cable, automatic switching.
- Support TCP Server, TCP Client, UDP, UDP Server, HTTPD Client various of work modes.
- Support virtual serial work way, provide corresponding software.
- Serial port highest baud rate from 110bps to 1024000bps.
- 5V power input
- Support DHCP automatically access IP, can inquire the facility within network through the UDP broadcast protocol.
- Supply the protocol for VIP customers, can integrate parameter seting function to user software applications.
- Provide PC TCP/IP SOCKET programming example, VB, C++, Delphi, Android, IOS.
- Support parameter setting via web pages, can customize web pages for users.



- Can also set via UDP, provide the set up protocol and software source demo code.
- Reload pin, pull down when power on ca restore default Settings.
- RJ45 status indicator light, RJ45 interface built-in isolation transformer, 2 KV isolation.
- The global only MAC address bought from IEEE, the user can modify MAC address you wanted(in misc web pages).
- Support upgrade firmware via network.
- Support upgrade webpages via network
- Support IP and domain name at the same time
- Support up to 5 link from client when act as TCP Server, send and receive data with or no id.
- Can modify http server port for module built-in web pages.
- Support Keepalive.

## **1.2.** Applications

- Fire and Security Panels
- Vending Machines
- Point of Sale Terminals
- Remote equipment management
- IT management services
- Access Control
- Industrial Control
- Home Automation
- Instrumentation
- Building Control
- Power Management

## 1.3. Order information

Туре	Part Numbers	Electric interface
the IOT Core Controller	USR-IOT1	TTL

Diagram 1-1 Order information

List:

USR-IOT1 coreboard ------ 1

## **1.4. Electrical characteristics**

DC Power Supply Voltage: DC 5V Operating supply current : Max 200 MA, average 150mA Operating Temperature: -25~75 °C (industry version) Storage temperature: -40~85 °C



## 2. Quick use

### 2.1. Power on



Diagram 2-1 hardware

Support IOT1 with DC5V adaptor(or 2.54 power connector, supply more than 150mA

current), you will see the POWER LED(red) on and WORK LED(green) twinkle every 1 second, indicating that IOT1 device has work normally.



Diagram 2-2 connect

## 2.2. Connect and login in

Then, connect IOT1 with your computer using network cable, set your PC with static IP such as 192.168.0.10, Open brower and input 192.168.0.7 which is IOT1 default IP, then enter, we will

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see:

🗿 USR-IOT1 - Microsoft Internet Explorer	
文件 (E) 编辑 (E) 查看 (Y) 收藏 (A) 工具 (E) 帮助 (H)	A.
③ 后退 ▼ ③ ▼ 区 😰 🟠 🔎 搜索 ☆ 收藏夹 🤗 😥 ▼ 🗟 ▼	
地址 (D) 🍯 http://192.168.0.7/	▶ 转到 链接 》
USR-IOT1	Chinese
Please login:	language_selection 🗡
User name : admin Pass word : ••••• Login Reset	
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8	🥑 Internet

Diagram 2-3 login in page

Default user name: admin

Default pass word: admin

Click login, we will enter this page, shows status such as current IP and MAC address etc.

# Status and Configuration

Name:	USR-IOT1
Firmware Revision:	2006
IP Address:	192.168.0.7
MAC Address in use:	00-11-22-33-44-56

Diagram 2-4 current status

On the left is the page index



1. Current config and status

USR-ES1 User Manual

- 2. PORT0 settings
- 3. PORT1 settings
- 4. PORT2 settings
- 5. Web to Serial
- 6. Web IO
- 7. Miscellaneous settings

Diagram 2-5 page index

- 1) Current config and status
- 2) PORT0 settings: first serial to ethernet
- 3) PORT1 settings: second serial to ethernet
- 4) PORT2 settings: the IOT communication channel
- 5) Web to Serial: receive or send data from webpage
- 6) Web IO: config and use IO from webpage
- 7) Miscellaneous settings: including IP or module etc.

## 2.3. Use WEB IO

Click WEB IO on the left and open WEB IO page.



Diagram 2-6 WEB IO

Default IO configuration is 1 channel output and 1 channel output, check the IO pin table we can see the output pin is PE0 and input pin PE1. "GREEN" represent logic "1" and "RED" represent logic "0".

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Connect your IO devices such relay(with TTL interface) or key, click Output "1" will see the relay switch; the page will automatically refresh input status.



# 3. Paramters configuration

# 3.1. Web page

You can config IP, serial to ethernet, WEB IO or WEB Uart through webpages.

🗿 USR-1011 - Microsoft Internet	Explorer							
文件 (E) 编辑 (E) 查看 (Y) 收藏 (A) 工	文件で)編編で) 査者 (V) 吹催 (A) 工具 (C) 帮助 (B) 🦧 👔							
🔇 后退 🔹 🕥 🕤 💌 😰 🏠 🔑 搜索	숡 收藏夹 🕢 😥 - 头 🕟 -							
地址 (1) 🗃 http://192.168.0.7/login.cgi?	user=admin&pass=admin		✓ → 转到 链接 ※					
济南有人物联网技术有 Jinan USR IOT Co., Ltd.	]限公司 U <mark>sr.cn</mark>	USR-IOT1	Chinese Logout					
<ol> <li>Current config and status</li> <li>PORT0 settings</li> <li>PORT1 settings</li> <li>PORT2 settings</li> </ol>	Port 0 Settings The current settings for port 0 may be chan ensure that "Save these as next reset de checked, the changes are applied to the pr	ged using the form below. To make the new settings apply each time th fault settings." is checked before pressing the "Apply Changes" butto if but the existing defaults are used whenever the module is next reset.	e S2E module is reset, n. If this control is not					
5. Web to Serial		Undated						
6. Web IO	Baud Rate:	115200 v bits/S						
7. Miscellaneous settings	Data Size:	8 v bits/character						
	Parity:	None 👻	Ξ.					
	Stop Bits:	1 v bit(s)						
	Flow Control:	None						
	Local Telnet Port Number:	23						
	Remote Telnet Port Number:	23						
	Work Mode:	TCP Server VINone Modbus TCP						
	TCP Server detail	1 max, typical v type						
	Telnet Server Addr:	192. 168. 0. 201 [N/A]						
	Telnet Timeout:	0 seconds (< 256, 0 for no timeout)						
	UART packet Time:	10 ms (< 256)						
	UART packet length:	200 chars (< 1024, 0 for no use)						
		Submit Save these as next startup default settings.						
和幸些			Thternet					
2)完毕			🤡 Internet					

Diagram 3-1 config through webpage

## 3.2. Software

Downbelow is the Setup for USR-IOT1





Diagram 3-2 Setup software



Diagram 3-3 connect device



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Diagram 3-4 IO resources



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Diagram 3-5 Config resources





## 4. Function use

## 4.1. IO

The IO features

- 1) 3.3V TTL, All IO tolerate 5V
- 2) 8mA max pin drive current
- 3) Output timing Func

IO distribution:

When distribute IO, all output in front and input at end. Take for example, if we config 2 output and 1input, check IO table, we will see PE0 and PE1 was allocated as Output1 and Output2, PE2 was allocated as Input1.

### 4.1.1. WEB IO

## WEB IO

Select how many io you wish(max 24 IO port):





#### Diagram 4-1 WEB IO

After WEB IO page opened, the page will refresh all IO status every 2 seconds. "submit"

input and output number	Output: 4	V Input: 3	*	,will save these config into IOT1



device, if you want to save Output status after next reset too, please use the software 10 Betalexe

### 4.1.2. Software IO

C	Device	Ð	Control <u></u> රු
device p	USR device name D8-B0-4C-00-01-64 MAC	Device C	channel pic Output channel name IO TEST
-Cite	<b>USR</b> D8-B0-4C-F2-20-9C	Device C	No name
<i>.............</i>	USR-WP3-TEST		Input
	D8-B0-4C-F2-20-44	Passwor	No name
			РШМ
			No name         1000 Hz           58
	Diagram 4-2 (	Quitout and 1 In	out
▲ The eli		the output and 1 m	Jui
✓ The cho			5
• When it	nput status change, the	icon will displ	ay.
◆ The Ou	tput can be used as timing func, c	lick and	will show the dialog.



www.usr.so



	Task list
	Task Add
SartTime	2013-09-24 09:39 🔻
Week	Everyday 🔻
Cantual	SU MO TU WE TH FR SA
Control	<ul> <li>Turn ON</li> <li>Turn OFF</li> <li>Turn Reverse</li> </ul>
C	OK Cancel
Ado	d Close

Diagram 4-3

There is an demo MV below:



Diagram 4-4 MV



There is an MV at: http://v.youku.com/v\_show/id\_XNjIxMzAxMDUy.html

### 4.1.3. IO table

IO index	Pin name
1	PE0
2	PE1
3	PE2
4	PE3
5	PE4
6	PE7
7	PC5
8	PC6
9	PD0
10	PD1
11	PD4
12	PD5
13	PD6
14	PD7
15	PB2
16	PB3
17	PB4
18	PB5
19	PB6
20	PB7
21	PA4
22	PA5
23	PE5
24	PE6

Diagram 4-5 IO table

### 4.2. PWM

### 4.2.1. Software configuration

PWM can only be used through software, features are

- 1) Each channel's frequency and duty cycle can be modified.
- 2) Frequency ranges from 800Hz ~ 100KHz, steps by 1Hz.

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- 1. Pulse width can be changed online.
- 2. Up to 2 channels, must have same frequency, width can be different.



#### Diagram 4-6 PWM control

Default PWM number is 0. Users can change it in device setting dialogue.

	Devi	ce	se	tti	ng		×
		0		A		Change	^
Add to router:	SSID Nan	ne:	1		¥	Search	
	SSID Pass	SWO	rd:			Add	
IO setting:	Output: Input: PWM: REG:	<	16 0 2 0 Auto :	۲ ۲ ۲		Change	
	REG:	<	0 Auto s	► save			

There is an MV about IOT at: http://v.youku.com/v\_show/id\_XNjlxMzAxMDUy.html



### 4.2.2. PWM pin table

index	Pin name
PWM1	PC7
PWM2	PC4

### **4.2.3.** Application (LED dimming)

• Circuits configuration;

USR-IOT1  $\times 1$ 

PWM dimmer(output current:300mA)  $\times 1$ 



1Walt LED (work voltage: 3.2V-3.6V work current: 350mA)  $\times$ 3



Connection
 Supply IOT1 with DC 5V by power adater. Connect the IOT1 with your computer using

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network cable. Supply PWM dimmer with DC 12V by power adapter, connect LED with output of dimmer. The PWM signal input connect to the pin PWM1 of IOT1, that is PC7, and IOT1 have common GND with dimmer.



Open smart IOT software, configure IOT1 with one PWM channel, here we set 1KHz frequency for dimmer requirement.

Drag the progress bar of duty cycle from 0 to 100, you will find LED glow brighter.







5% duty cycle



50% duty cycle

## 4.3. webpage

With built-in webpage, 2 language can be selected. Customer can also develop webpage of WEB IO and WEB Uart.

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- 1) Current Webpage size is 93K Byte(bin file), maximum 133K Byte
- 2) All webpage is aquaired by mothods of HTTP GET!

#### **4.3.1.** How to upgrade webpage

目标IP: 192.168.0.	7	
选择路径:		升级

Diagram 4-7 upgrade webpage

There will be an dialog for update, select path for webpage folder(max 30 files, only WEB IO and WEB Uart can be modified)

浏览文件夹 请选择网页文件夹	×
■ USR-IOT ■ deving ■ IOT1演示图片视频 ■ IOT升级包 ■ IOT软件 ■ 固件升级工具 ■ M页升级工具 ■ ITS ■ WEW_PIC ■ DC	•
<ul> <li></li> <li>&lt;</li></ul>	▶

Diagram 4-8 update dialog

Note:

1) Max space for WEB IO and WEB Uart can not exceed 50KBytes

#### 4.3.2. "/webio.shtml"

(cn page: "/webiocn.shtml")

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USR IOT
Be Honest, Do Best !

Form name	Form detail name	CGI	explaination	Data flow direction
	webio.outnum	webio.cgi	Max output number	<->
"webio"	webio.innum	webio.cgi	Max input number	<->
"data"		webiow.cgi	Toggle one output. server will toggle this output and return status of all IO including this one. (data>'1'&&data<'24')	client -> server

Note:

- If you want to refresh IO status, can send periodically(every 2 seconds) to server with"./webiow.cgi?data=0", because data is 0, so it won't change any pin status and can refresh status.
- 2) "Outnum" and "innum" was used to submit output and input max number or read it.
- 3) Use HttpRequest。

#### 4.3.3. "/webiodata.shtml"

Form name	Form detail name	CGI	explaination	Data flow direction
"wiodat"		webiow.cgi	All current IO status	server -> client

注:

- 1) "wiodat" is the IO status which server send to client. Lower bit is the first IO, upper is the second ... This data is trigger by client send"./webiow.cgi?data=".
- 2) Use HttpRequest.

### 4.3.4. "/uart.shtml"

WEB to Uart webpage

Form name	Form detail name	CGI	explaination	Data flow direction
port		uartw.cgi	Comm port	client -> server
			(0,1,2)	
type		uartw.cgi	Data type	client -> server
			(0 for ascii;1	
			for hex)	
data		uartw.cgi	Data send to	client -> server
			uart	

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port	 uartr.cgi	Comm port	client -> server
type	 uartr.cgi	Data type (0 for ascii; 1 for hex)	client -> server
data	 uartr.cgi	Data send to uart	client -> server

注:

- 1) Send to device uart: "./uartw.cgi?data=www.usr.cn&port=1&type=1"。
- 2) Read from device uart: "./uartr.cgi?clr=0&port=1&type=1"。
- 3) Type: 1 for HEX; 0 for ASCII

### 4.3.5. "/uartdata.shtml"

WEB to Uart: data read from uart

Form name	Form detail name	CGI	explaination	Data flow direction
"uartdata"		Uartw.cgi / uartr.cgi	Data read from	Server -> client
			uart	

Note:

1) Read data from uart





## 5. Hardware interface

## 5.1. USR-IOT1

#### 5.1.1. Hardware size



Diagram 5-1 USR-IOT1 view from top





Diagram 5-2 USR-IOT1 view from bottom

- 1) Mechanical size: module( $L \times W \times H$ )82 $\times 50 \times 18$ (mm) including RJ45 and connectors
- 2) PCB size: (L×W)80×50(mm)
- 3) 5V power input, DC5V plug and 2.54\*2 power connectors
- 4) 2.54 mm connectors, small size, easier for embedded uses



**USR-IOT1** 



#### 5.1.2. Power



Diagram 5-3 power interfaces Power please use DC 5V adaptor or 2.54 power connectors.

#### 5.1.3. Battery interfaces

Battery interfaces for RTC, voltages range from  $1.5V{\sim}3.3V_{\,\circ}$ 



Diagram 5-4 battery interface

Note:

1) RTC function not available yet!

### **5.1.4.** Connectors (6)



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Diagram 5-5 PCB brief

Each of the connectors show below:

GND	P4	3V3	GND	P5 1 2	3V3
PAO/REDO PA2/RTS1 PA4 PA6/I2C1SCI	3 4 5 6 7 8 9 10	PAI/TxD0 PA3/CTS1 PA5 PA7/I2C1SDA	PB0/C150 PB2 PB4 PB6	- 3 4 - 5 6 - 7 8 - 9 10	PBDRTS0 PB3 PB5 PB7/NRST
	10PIN2.54			10PIN2.54	
GND PCD PC2 PC4 PC6	1         2           3         4           5         6           7         8           9         10	3V3 PC1 PC3 PC5 PC7	GND PD0 PD2/RxD1 PD4 PD6	1 2 3 4 5 6 7 8 9 10	3V3 PD1 PD3/TxD1 PD5 PD7
	P8			P9	
PE0 PE2 PE4 PE6/CTS2	1 2 3 4 5 6 7 8 9 10	PE1 PE3 PE5/RTS2 PE7	GND PFD/LED_W PGD/RxD2 VDD	ORI 2 3 4 5 6 7 8 9 10	PF1/Reload PG1/TxD2 VDD
	10PIN2.54			10PIN2.54	

#### Diagram 5-6 6 channel of IO

Including PA-PG, for every connector, pin1 is GND, pin 2 is 3.3V, is shown on the other side of board.

Note:

- 1) not every pin can be used as IO or PWM, please check IO table or PWM pin table before use them.
- 2) PF and PG only have pin 0 and pin 1

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```



### 5.1.5. Universal interfaces (1)



Diagram 5-7 universal interface

Including 3 UART (uart2 can not be used as serial to ethernet,), and LED\_WORK Reload RST etc..

Note:

- 1) Interfaces compatible for APC220 wireless module (software not available yet!)
- 2) VDD (DC5V, outside power supply) and 3V3(DC3.3V).

#### 5.1.6. Indicating LED





Diagram 5-8 Indicating LED

Note:

- 1) WORK(GREEN): twinkle every 1 seconds
- 2) POWER(RED): On after power supply is feed
- RJ45: GREEN on, indicating network connected physically; YELLOW on, indicating that data flow

#### 5.1.7. RJ45 interface

Internet access port connection, module network interface is 10 M / 100 M adaptive, support AUTO MDI/MDIX, can discretionarily connect cross-over or direct network cable. That is to say, you can use direct cable to connect with computer or test.

	Diagram 5-5	4 Pin(default NC)	
Pir	Name	Description	
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1	TX+	Transceiver Data+
2	TX-	Transceiver Data-
3	RX+	Receive Data+
4	n/c	Not connected
5	n/c	Not connected
6	RX-	Receive Data-
7	n/c	Not connected
8	n/c	Not connected

Diagram 5-10 RJ45 interface

Note:

1) Default 4 Pin is not connected.

#### 5.1.8. Reload

Pull Reload pin down and power on, then free it, device will be factory settings.

Default settings main parameters as followsAddress type:static IPStatic IP Address:192.168.0.7User name:adminpassword:adminModule name:USR-IOT1

Using web pages can also restore default settings.

#### Restore Factory Defaults



Diagram 5-11 restore defaults through web pages

## 5.2. USR-IOT1 V2





Diagram 5-13 Interfaces

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Diagram 5-14 Connection with V2

The other functions is same with USR-IOT1 V1



USR-IOT1

Diagram 5-15 Connection diagram



## 5.3. USR-IOT2

#### 5.3.1. Hardware characteristic



Diagram 5-16 USR-IOT2 with shell



Diagram 5-17 USR-IOT2 without shell

- 1) Mechanical parameters: device size (L×W×H):  $160 \times 115 \times 25$ (mm) with shell
- 2) PCB size(L×W): 150×115(mm)

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- 3) Power supply: AC220V plug or DC5V, 2.54-2
- 4) 8 relay out
- 5) 6 key input
- 6) 1 RS232, serial to ethernet transparent.



Diagram 5-18 hardware interface

#### 5.3.2. Power supply

2 kind of power supply, only 1 should be choosen.

- Default use AC220V plug.
- You can also choose DC5V, 2.54-2 pin.

Please see 错误!未找到引用源。

#### 5.3.3. Battery interface for RTC

With battery interface for RTC, the battery voltage ranges from 1.5V to 3.3V.

#### 5.3.4. Relay output (8 channel)

Relay paramters will be 10A 250VAC, 10A 30VDC.

Output used 3.81-14 terminal, the pin close to AC220V plug is index 1, the other side is 14.

index	name	description	
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1	OUT_1	Channel 1 open
2	OUT_1'	Channel 1 close
3	OUT_2	Channel 2 open
4	OUT_2'	Channel 2 close
5	OUT_3	Channel 3 open
6	OUT_3'	Channel 3 close
7	OUT_4	Channel 4 open
8	OUT_4'	Channel 4 close
9	OUT_5	Channel 5 open
10	OUT_5'	Channel 5 close
11	OUT_6	Channel 6 open
12	OUT_7	Channel 7 open
13	OUT_8	Channel 8 open
14	REF	Reference

### 5.3.5. Key Input (6 channel contactor)

Contactor input, means user don't need to apply outside voltage signal, key will do.

The key can be used between every key input and GND. Hardware form is 8 pin S-Terminal, including 6 key, +3.3 and GND.



Diagram 5-20 one side of device

S-Terminal pin description:

index	name	description
1	+3.3V	3.3V power +

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2	KEY1	Key inpuyt 1
3	KEY2	Key inpuyt 2
4	KEY3	Key inpuyt 3
5	KEY4	Key inpuyt 4
6	KEY5	Key inpuyt 5
7	KEY6	Key inpuyt 6
8	GND	GND

Diagram 5-21 S-Terminal pin description

#### 5.3.6. Indicator

Indicator position please see Diagram 5-20 one side of device.

index	name	description
1	POWER (red)	power
2	WORK (green)	When work, blink every 1 seconds
3	LINK (green)	When net cable connected, on
4	DATA (yellow)	When data arrived or send, blink

Diagram 5-22 Indicator description

#### 5.3.7. RJ45

10 / 100M ethernet controller, with built-in ethernet transformer and 10kV electromagnetic isolation.

Ethernet interface with Link and Data indicator, RJ45 position please see Diagram 5-20 one side of device.

### 5.3.8. Reload parameters

Press Reload key, then er-power the device, keep it pressed for over 1 second, then release it, the device parameters will be restored.

Factory parameters will be:

- Static IP: 192.168.0.7
- Submask: 255.255.255.0

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#### • Gateway: 192.168.0.1

Resources: 8 channel output, 6 channel input, 0 channel PWM, 0 channel register.

## 5.4. USR-IOTprotocol sample

#### 5.4.1. Note

USR-IOT1 and IOT2 does not support command 0x07 0x08 0x09.

#### 5.4.2. Read resource quantity

TCP send: 55 AA 00 02 00 7E 80 TCP receive: AA 55 00 07 00 FE 10 00 00 00 00 15

#### 5.4.3. Read all output status

TCP send: 55 AA 00 02 00 0A 0C TCP receive: AA 55 00 05 00 8A 00 00 00 8F

#### 1.1.1. Read resources name

#### TCP send: 55 AA 00 02 00 63 65

#### 5.4.4. Read PWM pulse width and fre

TCP send: 55 AA 00 02 00 24 26 TCP receive: AA 55 00 08 00 A4 05 03 20 3C 00 00 10

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#### 5.4.5. Single output set

TCP send: 55 AA 00 03 00 02 01 06 TCP receive: AA 55 00 04 00 82 01 01 88

#### 5.4.6. Single output clear

TCP send: 55 AA 00 03 00 01 01 05 TCP receive: AA 55 00 04 00 81 01 00 86

#### 5.4.7. All output set

TCP send: 55 AA 00 02 00 05 07 TCP receive: AA 55 00 03 00 85 01 89

#### 5.4.8. All output clear

TCP send: 55 AA 00 02 00 04 06 TCP receive: AA 55 00 03 00 84 00 87

#### 5.4.9. Config resources quantity

TCP send: 55 AA 00 06 00 72 08 06 01 00 87 TCP receive: AA 55 00 07 00 F2 08 06 01 00 00 08

#### 5.4.10. Save current config

TCP send: 55 AA 00 02 00 7A 7C TCP receive: AA 55 00 02 00 FA FC

#### 5.4.11. Set time

TCP send: 55 AA 00 06 00 54 53 66 17 DA 04 TCP receive: AA 55 00 07 00 D4 01 53 66 17 DA 86 Set time: 2014-05-04 10:35:06

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#### 5.4.12. Read time from device

TCP send: 55 AA 00 02 00 53 55 TCP receive: AA 55 00 06 00 D3 53 66 17 EF 98 Read time: 2014-05-04 10:35:27

### 5.4.13. Modify device name

TCP send: 55 AA 00 12 00 74 4D 79 20 64 65 76 69 63 65 00 00 00 00 00 00 00 DC TCP receive: AA 55 00 12 00 F4 4D 79 20 64 65 76 69 63 65 00 00 00 00 00 00 00 5C



## 6. Specific functions

## 6.1. Keepalive

When connect is established and idle, device will send serval empty packet to see if this link is still active, if not, link will be closed and reconnect.

### 6.2. Hardware flow control

RS232 interface support hardware flowcontrol (RTS/CTS)

Pin name	Description	IO type	Operater			
RTS Request to Send O module						
CTS Clear to Send I Outside device(PC)						

Diagram 6-1 Pin description

When RTS = 0, enable the other side to send, at this time, TTL is 0 volt, RS232 is -3V ~

-15V;

When CTS = 0, represent module is enabled to send, at this time, TTL is 0 volt, and RS232 is  $-3V \sim -15V$ ;

When the logic is reverse, represent that disable the other side to send or was disabled the module to send.

When connect with PC's RS232 interface, we can use the serial cable(cross).

### 6.3. User MAC address

User MAC address default is 6 bytes of 0xff, that is: FF-FF-FF-FF-FF,

If defaults, use the factory MAC address such as: ac- cf-23-20-fe-3d;

If not, user MAC address will take effect.

When modify this address, insert '-' between bytes, or insert nothing. Click 'Update Settings' to save parameters, reset to take effect.



## **General Configuration Settings**





In Current config and status, can see the currently MAC address in use. Diagram below is using the factory MAC.

# Status and Configuration

Name:	USR-TCP232-E
Firmware Revision:	2003
IP Address:	192.168.0.7
MAC Address in use:	ac-cf-23-21-00-25

Diagram 6-3 currently MAC in use

## 6.4. Telnet Timeout

Telnet timeout default not use, value 0, see diagram below.



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Stop Bits:	1 v bit(s)
Flow Control:	None 💌
Local Telnet Port Number:	23
Remote Telnet Port Number:	23
Work Mode:	TCP Server 💌 None 💌 Modbus TCP
TCP Server detail	1 max, typical 💌 type
Telnet Server Addr:	192.168.0.201 [N/A]
Telnet Timeout:	0 seconds (< 256, 0 for no timeout)
UART packet Time:	10 MS (< 256)
UART packet length:	200 Chars (< 1024, 0 for no use)
	Submit Save these as next startup default settir

#### Diagram 6-4 Telnet Timeout

Telnet timeout represent no data timeout, 0 not use, max 255 (seconds).

After connection is established, no data last for timneout seconds, module will disconnect and reconnect.

When TCP Server mode, the module will disconnect with client, release resources, and waiting for new connection, clear time count;

When TCP CLient mode, the module will disconnect with server and reconnect.

Telnet timeout represent no signal reconnect timeout (seconds).

## 6.5. Firmware update

Use search and config software 🏟 USR-ICP232-E45 V1.0.5.0 to update firmware, only

once for one time, can not cross network segment.

1. Search and select one module



Device (D) Search List Device IP Device Name MAC Version 192.168.0.66 USR-TCP232-E AC CF 23 20 FE 3D 2003 Search Device	Com	l port	serial	tual	add vir	series	P232-E45	USR-TCP	R 10
Search List       Device IP     Device Name     MAC     Version       192.168.0.66     USR-TCP232-E     AC CF 23 20 FE 3D     2003								rice (D)	Devi
Device IP     Device Name     MAC     Version       192.168.0.66     USR-TCP232-E     AC CF 23 20 FE 3D     2003								Gearch List -	Se
192.168.0.66     USR-TCP232-E     AC CF 23 20 FE 3D     2003       Q     Search Device		Version		;	MAC	e Name	P Devic	Device IP	
Search Device		2003	) FE 3D	CF 23 20	AC CI	TCP232-E	0.66 USR-1	192.168.0.	I
Search Device									
Search Device									
Search Device									
Search Device									
Search Device									
Search Device									
				се	Search Devic	Q			
Upen Device Read Conrig		Temporary	🥜 Read 1	,	Read Config		Open Device	0	
🔄 Device Reset 🛛 📋 Save Config 🛛 🥥 Default Config		ault Config	🥥 Defa	,	Save Config		Device Reset	5 D	

Diagram 6-5 search and select

2. 'Device' -> firmware update

Fi	irnware Upgrade
	Select Client
	Client IP Address: 192.168.0.66
	Client MAC Address: AC CF 23 20 FE 3D
	Select .bin file C:\6432_StellarisWare\boards\rdk-s2e\500_ser2
	Program Exit

### Diagram 6-6 firmware update

Click

to start update progress.

Program

.(





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Firmware Upgrade		
-Select Client		
Client IP Address:	192.168.0.66	
Client MAC Address:	AC CF 23 20 FE 3D	
Select .bin file		
Program	Exit	
Upgrade progress25%		

Diagram 6-7 in update progress

3. Update success, click exit.

Firmware Upgrade		
Select Client		
Client IP Address: 192.168.0.66		
Client MAC Address: AC CF 23 20 FE 3D		
Select .bin file		
I)_modbus\rvmdk\ser2enet_20130408101406.bin		
Program Exit		
Upgrade successful.please restore factory de		

#### Diagram 6-8 success

Note. After update, if can not search module, restore to factory will fix this problem.

# 7. Common questions

## 7.1. Work across network segment

If your device's IP is 192.168.0.7, and remote PC's IP is 192.168.1.7, we need to config. Subnet mask of TCP232 device, PC, and router to 255.255.0.0, if not ,the TCP232 module will not communicate normally.



## 7.2. Ping is OK but can not open web pages

Some possible causes

- 1. Module is set a static ip and conflicts with another ethernet device.
- 2. Cross network and false subnet mask .
- 3. HTTP server port is modified(default 80).

Solutions:

- 1. Set another static or use DHCP.
- 2. Set correct subnet mask.
- 3. Set this port to 80 or open web page with correct port.

### 7.3. After firm update, can not open web page

Reload this module back to factory settings.

### 7.4. When connection established, server received serval

#### chars

Possible causes.

1) Module id type is not 0.



Diagram 7-1 Module id type

Solutions.

1) Module id type set 0.

### 7.5. Every serval seconds, module reconnect

Telnet Timeout was set to none 0 value.

Solutions

1) Give Telnet Timeout 0 or send data before timeout.



## 8. Contact us

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# 9. Modified history

- 1) V1.0 file established
- 2) V1.0.2 add IOT2 information
- 3) V1.0.3 modify the IO pin table
- 4) V1.0.4 modify the IO table PC2\3 to PE5 / 6
- 5) V1.0.6 add PWM application