F2X64 Series	Documentation No.	Product	Version	Page
User Manual			V1.3	
	Product Name: F2	X64		Total:96

F2X64 Series User Manual

The user manual is suitable for the following model:

Model	Product Type
F2164	GPRS RTU
F2264	CDMA RTU



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Contents

Chapter 1 Brief Introduction of Product	9
1.1 General	9
1.2 Features and Benefits	9
1.3 Working Principle	11
1.4 Specifications	12
Chapter 2 Installation Introduction	14
2.1 General	14
2.2 Encasement List	14
2.3 Installation and Cable Connection	14
2.4 Power	19
2.5 Indicator Lights Introduction	19
Chapter 3 RTU Function Introduction	20
3.1 Multiple servers funticon	20
3.2 MODBUS protocol	20
3.2.1 MODBUS settings	20
3.2.2 TCP2COM description	21
3.2.3 MODBUS digital IO input introduction	21
3.2.4 MODBUS digital IO output introduction	22
3.2.5 MODBUS counter introduction	22
3.2.6 MODBUS analog input introduction	24
3.3 RTU extended protocol	25
3.4 Alarm function	26
3.5 Multiply configure parameters	26
3.6 Remote upgrade firmware	26
Chapter 4 Configuration	27
4.1 RS232/RS485 Configuration	27
4.1.1 Configuration introduction	27
4.1.2 Run the configure tool	28
4.1.3 Re-power RTU	29
4.1.4 Configuration	30
4.1.4.1 Digital channel settings	30
 Digital input function 	30
◆ MODBUS logic corresponding function	31
◆ Acquisition purpose	31
◆ Acquisition interval	31
◆ Alarm trigger condition	32
♦ Alarm content	32
◆ Alarm phone number	32
Xiamen Four-Faith Communication Technology Co.,Ltd. Page 5 of	96
Add: J1-J3,3"FIOOR,NO.44,GUANRIKOAd,SOTTWARE PARK,XIAMEN .361008.China http://www.fourfaith.com Tel: +86 592-6300326 6300325 6300324 Fax: +86 592-5912735	;



4.1.4.2 Optocoupler and relay settings	
◆ Digital output function	
◆ MODBUS logic 1 output	
◆ MODBUS logic 0 output	
◆ MODBUS logic 1 square-wave cycle	
◆ MODBUS logic 0 square-wave cycle	
◆ Default output voltage	
4.1.4.3 Analog channel settings	
◆ Analog input function	
♦ Set sensor range	
◆ Set sensor voltage or current output	
♦ MODBUS function	
◆ Acqisition function	
◆ Acqisition interval	
◆ Alarm trigger condition	
♦ Alarm content	40
◆ Alarm phone number	
◆ Active report function	41
.4.1.4.4 RTU counter report Alarm settings	41
◆ Counter function	
♦ Counter work mode	
◆ Counter initial value	
◆ Alarm function	
♦ Alarm content	
◆ Alarm phone number	
◆ Alarm upper limit	43
◆ Active report interval	
◆ Alarm report method	44
◆ Continuous alarm interval	44
◆ Continuous alarm number of times	45
◆ Alarm administrator number	45
4.1.4.5 ModBus Setting	
◆ ModBus work mode	
◆ ModBus address	
◆ RTU work mode	
4.1.4.6 Data Service Center Settings	
◆ Data Center Number	
 Main Center Addr+Port: 	
 Backup Center Addr+Port: 	49
 Multi DSC Configuration 	50
Main and Backup Center DNS Server	51
◆ Center 2~5 DNS Server	
our Feith Communication Technolomy Co. 14d	D (00(

Xia	men Four-Faith C	omm	unication Tech	nology C	o.,Ltd.		Page 6 of 96
Add:	J1-J3,3 rd Floor,No.4	44,Gua	anRiRoad,SoftWare	e Park,Xia	Men .3610	08.China	
http:	//www.fourfaith.com	Tel:	+86 592-6300326	6300325	6300324	Fax: +8	6 592-5912735



4.1.4.7 Device Settings	52
♦ Work Mode	52
◆ Trigger Type	53
◆ Disconnect to Trigger mode	53
◆ Debug Level	53
◆ Databit, Parity, Stopbit	54
Communication Baudrate	54
◆ Auto Back To Main Server	55
◆ Device ID	55
◆ SIM Card No	55
♦ Bytes Interval	56
◆ Custom Register String	56
♦ Custom Heartbeat String	56
◆ Reconnect setting	57
◆ Transfer meanning	57
4.1.4.8 Other Settings	58
♦ Network	58
♦ SMS Center	59
♦ Heartbeat Interval	59
◆ Call Trigger Phone No	60
◆ SMS Trigger Password	60
◆ Data Trigger Password	60
◆ TCP MTU	61
◆ Multi Center Reconnect Interval	61
◆ Set parameter of configure SMS	61
4.1.4.9 Scheduled Power ON/OFF Setting	62
◆ RTC(Real Time Clock) Time Setting	62
◆ Power On/Off Setting	63
4.1.4.10 SMS Setting	72
• Destination number	72
◆ SMS Sending Format	73
◆ Data upload Style	73
4.1.4.11 Functions	74
♦ Show Configure	74
• Show Baudrate	74
♦ Auto Detect	74
♦ Version Display	74
♦ Signal Value	74
◆ Factory setting	75
♦ Clear Output	75
♦ Save Output	75
◆ Browse	75

Xia	<u>men Four-Faith C</u>	omm	unication Tech	nology (<u>:o.,Ltd.</u>		Page 7 of 96
Add:	J1-J3,3 rd Floor,No.	44,Gua	anRiRoad,SoftWare	e Park,Xia	Men .3610	08.China	
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Four-Faith	User Manual
◆ Save Configure	
◆ Load Configure	75
4.1.5 Work State Switch	
4.2 Setting by SMS	
4.2.1 Setting by AT command of SMS	
4.2.2 setting remote upgrade	77
4.3 Setting for RTU extended protocol	77
Chapter 5 Software Manual	
5.1 TCP2COM manual	
5.1.1 Open software	
5.1.2 Install the driver	
5.1.3 Add virtual serial port	
5.1.4 Setting the server parameters	
5.1.5 Server connection state	
5.1.6 Monitor	
5.1.7 Not transmited data query	
5.1.8 Delete database data	
5.1.9 Quit	
5.2 RTU center service	
5.2.1 Open software	
5.2.2 Service setting	
5.2.3 Start equipment and connect	
5.2.4 View the acquisition data	
5.2.5 Send data to RS232/RS485	
5.2.6 Control optocoupler and relay	
5.2.7 Alarm information	
5.2.8 Center service information	
5.2.9 Query data	
5.2.10 Remote configure	
5.2.11 Upgrade	
5.2.12 Reset device	
Appendix	



Chapter 1 Brief Introduction of Product

1.1 General

F2x64 series is wireless remote terminal unit(abbreviation:RTU). RTU has many functions (analog input, switch input, switch output, pulse counting and wireless data communication ect).

It adopts high-powered industrial 32 bits CPU and embedded real time operating system. It supports RS232 and RS485 (or RS422) port that can conveniently and transparently connect one device to a cellular network, allowing you to connect to your existing serial devices with only basic configuration. It has low power consumption states in which the power consumption could be lower than 1mA@12VDC. It has compatible digital I/O channel, ADC, input pulse counter and pulse wave output function.



1.2 Features and Benefits

Design for Industrial Application

- High-powered industrial cellular module
- High-powered industrial 32 bits CPU
- Support low power consumption mode, including multi-sleep and trigger modes to reduce the power dissipation farthest
- Embedded Real Time Clock(RTC) circuit which can realize timing online/offline function
- Housing: iron, providing IP30 protection.

◆ Power range: DC 5~35V

Stability and Reliability

- Support hardware and software WDT
- Support auto recovery mechanism, including online detect, auto redial when offline to make it always online
- ◆ RS232/RS485/RS422 port: 15KV ESD protection
- ◆ SIM/UIM port: 15KV ESD protection
- Power port: reverse-voltage and overvoltage protection
- Antenna port: lightning protection(optional)

Standard and Convenient

• Adopt terminal block interface, convenient for industrial application

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Page 9 of 96



User Manual

- Support standard RS232 and RS485(or RS422) port that can connect to serial devices directly
- TTL logic level RS232 interface can be customized
- Support intellectual mode, enter into communication state automatically when powered
- Provide management software for remote management
- Support several work modes
- Convenient configuration and maintenance interface

High-performance

- 8 ch acquisition analog input(resolution: 16bit)Input voltage(0-5V),Input current(0-20mA), Sampling rate(1.365kSPS) , Accuracy $\pm 0.5\%$ or better
- 4 ch relay output (5A/30VDC,5A/250VAC)
- ◆ 4 ch optocoupler isolation output, open collector to 30V, 40mA max.load, power consumption 125mW
- 8 ch Digital input ("0": 0-3.3V, "1": 5-24V) . Contains all the way count function
- 2MB SPI FLASH
- Support dual data centers, one main and another as backup
- Support multiple data centers, it can support maximum 5 data centers
- Support multi-center multi-function(for example: one data center is MODBUS RTU protocol function, another data center is RTU extended protocol function)
- Support multiple online trigger ways, including SMS, ring and data. Support link disconnection when timeout
- Support dynamic domain name(DDNS) and IP access to the data center
- Support RS232/RS485 MODBUS RTU protocol
- Support TCP MODBUS RTU protocol using TCP2COM software that converts TCP to virtual serial port
- Support 8 digital inputs and 8 analog input manual query and automatic report
- Support 4 optocoupler isolated output ports and 4 relay outputs controlled via MODBUS RTU protocol
- Support pulse counter initiate value configurable, Its realtime value can be queried via MODBUS RTU protocol
- Support RTU extended protocol.

Add

- Acquisition data(8 analog inputs and 8 digital inputs) is reported periodically via RTU extended RTU protocal.
- Support RTU extended protocol. Reporting mode can be selected, there are three reporting mode, including Network only, SMS only and Main network SMS backup(it uses SMS. when network connect fail)
- Support RTU extended protocol. When reporting acquisition data failure, acquisition data are saved to 2M byte SPI FALSH
- Support RTU extended protocol. The data center can query acquisition data actively
- Support RTU extended protocol. It has counter function that the initial value of the timer is set and the value of the timer is queried
- Support RTU extended protocol. It has the data center and RS232/RS485 transparent transmission function

Page 10 of 96





- Support RTU extended protocol. it has alarm function, alarm information is reported automatically(alarm trigger conditions can be configured independently).
- Support RTU extended protocol. Can remotely reboot RTU
- Support RTU extended protocol. Can remotely configure the parameters
- Support RTU extended protocol. The remote upgrading parameters can be configured, RTU support remote upgrade firmware.
- Alarm function: Alarm information are reported through RTU extended protocol, SMS, or both SMS and RTU extended protocol
- When alarm information are reported through SMS, alarm number and alarm content of each channel can be configured independently
- The remote upgrading parameters can be configured by SMS. RTU upgrade the firmware immediately when it received the upgrade command.
- Built-in industrial clock, the acquisition time can be recorded through this clock
- Network is automatically connected, when device power on. Network is automatically reconnected when network is offline.
- Scheduled turn on and turn off power function make the device work in low-power mode

1.3 Working Principle

The principle chart of the RTU is as following:



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1.4 Specifications

Cellular Specification

Standard and Band	Bandwidth	TX power	RX
			sensitivity
F2164 GPRS RTU			
EGSM900/GSM1800MHz,	85.6Kbps	GSM850/900:	<-107
GSM850/900/1800/1900MHz(optional)		<33dBm	dBm
Compliant to GSM phase 2/2+			
GPRS class 10, class 12(optional)		GSM1800/1900:	
		<30dBm	
F2264 CDMA RTU			
CDMA2000 1xRTT 800MHz	153.6Kbps	<30dBm	<-104
800/1900MHz(optional)			dBm
450MHz(optional)			

Hardware System

Item	Content
CPU	Industrial 32 bits CPU
FLASH	2MB (Extendable 8MB)
SRAM	512KB (Extendable 1MB)

Interface Type

Item	Content
Serial	1 RS232 port and 1 RS485port, 15KV ESD protection
	Data bits: 5, 6,7, 8
	Stop bits: 1, 1.5, 2
	Parity: none, even, odd, space, mark
	Baud rate: 110~230400 bps
Indicator	"Power", "ACT", "Online"
Antenna	Cellular: Standard SMA female interface, 50 ohm
	lighting protection(optional)
SIM/UIM	Standard 3V/1.8V user card interface, 15KV ESD protection
Power	Terminal block interface, reverse-voltage and overvoltage
	protection

S.S.L.		ALC THE	E DE LE DE DE LE DE		OP STRAY	
1913	V8 V7 V6 V5 V4 V3 V2 V1					
	A1 A2 A3 A4 A5 A6 A7 A8 AG					
	IB 17 16 15 14 13 12 11					
		C	MIS			
				Online	ACT	
						and the second second

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User Manual



Power Input

Item	Content
Standard Power	DC 12V/0.5A
Power Range	DC 5~35V

Power Consumption

Working States	Power Consumption
Communication	88-100mA@12VDC
Standby	52mA@12VDC
Timing Power	0.9mA@12VDC
Off	

Physical Characteristics

Item	Content			
Housing	on, providing IP30 protection			
Dimensions	157x97x25 mm			
Weight	500g			

Environmental Limits

Item	Content
Operating	-35~+75°C (-31~+167°F)
Temperature	
Storage	-40~+85°C(-40~+185°F)
Temperature	
Operating	95% (Non-condensing)
Humidity	



Chapter 2 Installation Introduction

2.1 General

The RTU must be installed correctly to make it work properly. Warning: Forbid to install the RTU when powered!

2.2 Encasement List

Name	Quantity	Remark
RTU host	1	
Cellular Antenna	1	
Power adapter	1	
RS232 data cable	1	optional
RS485 data cable	1	optional
Manual CD	1	
Certification card	1	
Maintenance card	1	

 Table 2-1 Encasement List

2.3 Installation and Cable Connection

Dimension: (unit: mm)



Figure 2-1 Installation Chart

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Installation of SIM/UIM card:

Firstly power off the RTU, and press the out button of the SIM/UIM card outlet with a needle object. Then the SIM/UIM card sheath will flick out at once. Put SIM/UIM card into the card sheath (Pay attention to put the side which has metal point outside), and insert card sheath back to the SIM/UIM card outlet.

Warning: Forbid to install SIM/UIM card when powered!

Installation of antenna:

Screw the SMA male pin of the antenna to the female SMA outlet of the RTU tightly. Warning: The antenna must be screwed tightly, or the signal quality of antenna will be influenced!

Pin	Function	Interface	Default function	Function expansion
Number				
1	Dowor	PWR	Power input positive	None
2	rowei	GND	Power input negative	None
3		G/232	RS232 GND	None
4	рсэээ	RXD	RS232 Data receiving	None
5	K5252	TXD	RS232 Date sending	None
6		А	RS485 positive	Reserve compatible
	RS485			RS232 DIR
7		В	RS485 negative	Reserve compatible
				RS232 DSR
8	Digital	DI1/C	Digital input1	Counting function
9	Input	DI2	Digital input 2	None
10		DI3	Digital input 3	None
11		DI4	Digital input 4	None
12		DI5	Digital input 5	None
13	Digital	DI6	Digital input 6	None
14	Input	DI7	Digital input 7	None
15		DI8	Digital input 8	None
16		DIG	Digital input GND	None
18		DO1	Optocoupler output 1	None
19	Onterent	DO2	Optocoupler output 2	None
20	Optocoupl	DO3	Optocoupler output 3	None
21	eroutput	DO4	Optocoupler output 4	None
22		COM	COM GND	None
23	Relay	K1-	Relay output 1-	None
24	output	K1+	Relay output 1+	None

User Interface Signal Definition

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25		K2-	Relay output 2-	None	
26		K2+	Relay output 2+	None	
27		K3-	Relay output 3-	None	
28		K3+	Relay output 3+	None	
29		K4-	Relay output 4-	None	
30		K4+	Relay output 4+	None	
31		A1	ADC 1	None	
32		A2	ADC 2	None	
33		A3	ADC 3	None	
34		A4	ADC 4	None	
35	ADC	A5	ADC 5	None	
36		A6	ADC 6	None	
37		A7	ADC 7	None	
38		A8	ADC 8	None	
39		AG	AGND	None	

Installation of cable:

F2X64 adopts industrial terminal block interface. The recommendatory cable is 28-16AWG. The detail description of standard layout adapter and communication cables as is following:

Adapter (Rating Output 12VDC/0.5A):

Cable Color	Power Output Polarity
Black & White Alternate	Anode
Black	Cathode

RS232 Cable:

Cable Color	Corresponding DB9-M Pin Number
Brown	Pin 2
Blue	Pin 3
Black	Pin 5

RS485 Cable:

Cable Color	Signal definition
Red	RS485(A)
Black	RS485(B)





Power adapter and communication cable connection chart as following:







User Manual

Optocoupler output cable connection



Relay output cable connection



ADC cable connection



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2.4 Power

The power range of the RTU is DC 5~35V

Warning: When we use other power, we should make sure that the power can supply power above 4W.

We recommend user to use the standard DC 12V/0.5A power adaptor.

2.5 Indicator Lights Introduction

Indicator	State	Introduction
Light		
Power	ON	RTU is powered on
	OFF	RTU is powered off
ACT	BLINK	Data is communicating
	OFF	No data
Online	ON	RTU has logged on network
	OFF	RTU hasn't logged on network

The RTU provides three indicator lights: "Power", "ACT", "Online".



Chapter 3 RTU Function Introduction

RTU is based on our ip modem which has realized data transparent transmission. It can collect analog signal and digital signal. It also can output digital signal including 4 optocoupler isolated outputs and 4 relay outputs. It has pulse counter. Main functions as following:

- Support dual data centers, one main and another backup, support multiple data centers and it can support maximum 5 data centers, support multi-center multi-function(for example: one data center works with MODBUS RTU protocol, another data center can work with RTU extended protocol)
- 2. support multi online trigger ways, including SMS, ring and data. Support link disconnection when timeout
- 3. Network is automatically connect, when device offline, it will automatically reconnect.
- 4. Support RS232/RS485 MODBUS RTU protocol, support TCP MODBUS RTU protocol using TCP2COM software that converts TCP to virtual serial port.
- 5. Alarm function: Alarm information are reported through RTU extended protocol, SMS, or both SMS and RTU extended protocol
- 6. Multiple configure methods.
- 7. Local and remote upgrade firmware.
- 8. Scheduled turn on and turn off power function make the device work in low-power mode

3.1 Multiple servers funticon

RTU support multi-center multi-function. Each center functions can be configured independently, parameter settings please refer to appendix 4.1.4.6 Data Service Center Settings. Connection protocol please refer to appendix 4.1.4.7 Work Mode.

3.2 MODBUS protocol

RTU support RS232/RS485 MODBUS RTU protocol. The principle of TCP MODBUS RTU protocol is the same as RS232/RS485 MODBUS RTU protocol. TCP2COM softwave we provided realize TCP to virtual serial port function(it can remotely transfer MODBUS RTU protocol). The following introduces MODBUS RTU protocol, All of the following MODBUS data are high byte first (big-endian mode).

3.2.1 MODBUS settings

Enable MODBUS function, related settings please refer to appendix <u>4.1.4.5 ModBus Setting</u>, it also need to configure the digital input, digital output, analog input and counter input



3.2.2 TCP2COM description

TCP2COM softwave realize TCP to virtual serial port function. The principle of TCP MODBUS RTU protocol is the same as RS232/RS485 MODBUS RTU protocol. About using TCP2COM softwave, please refer to appendix <u>5.1 TCP2COM Manual</u>.

3.2.3 MODBUS digital IO input introduction

The MODBUS function code of digital IO input is 0x02(read input status), the starting register address is 0, there are total 8 digital input(register address from 0 to 7). The MODBUS settings of digital IO input please refer to appendix <u>4.1.4.1 Digital input function</u>.

Eg:

Query all digital input ports (all 8 input ports), command as following: 01 02 00 00 00 08 79 CC

Parse command:

Byte-	1	2	3	4	5	6	7	8
orders								
Content	01	02	00	00	00	08	79	CC
Parsing	Slave	Function	Start address		number of registers		Checksum	
	Address	code						
Meanin	01	Read	Address	is 0-7	Read the	value of	checksum	l
g		input	corresponding to		digital IO input.			
		status	IO1-IO8	3	This exa	nple read		
			seperate	∘ly∘	8 ports . I	f read one		
					channel,	this		
					parameter	should		
					be 0001			

Response

01 02 01 00 A1 88

Parse response:

Byte-	1	2	3	4	5 6
orders					
Content	01	02	01	00	A1 88
Parsing	Slave	Function	Data length	IO status value	Checksum
	Address	code			
Meaning	01	Read input	Data length	IO status value,	checksum

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Page 21 of 96



Four-Fa			User Manual
	statuss	bit0~bit7	
		corresponding to	
		IO1-IO8	

3.2.4 MODBUS digital IO output introduction

The MODBUS function code of digital IO output is 0x05, the starting address is 0, there are total 8 output ports(address 0-3 used for optocouplers output ports, corresponding to optocouplers port 1-4, address 4-7 used for relay outputs, corresponding to rlay output 1-4). The MODBUS configuration of digital IO output please refer to appendix <u>4.1.4.2 Optocoupler and relay settings</u>. Eg:

Control one digital IO output, command as following:

01 05 00 00 FF 00 8C 3A

Parse command:

Byte-	1	2	3	4	5	6	7	8
orders								
Content	01	05	00	00	FF	00	8C	3A
Parsing	Slave	Functio	Start address		Output value: FF00		checksum	
	Address	n code			means logic 1,			
					0000			
					means logic 0.			
Meanin	01	Force	Address is	s 0-3 used	The digital output		checksum	
g		single	for opt	tocouplers	value.			
		coil	output, address 4-7					
			used for relay					
			outputs					

Response 01 05 00 00 FF 00 8C 3A

Parse response:

The response command is the same as sending command, please refer to appendix the above control command.

3.2.5 MODBUS counter introduction

The counter input port and the first channel of digital IO input is the same pin.

The MODBUS function code of reading counter value is 0x03(read holding register), the starting address is 0. The MODBUS function code of setting counter initial value is 0x10(preset multiple registers), the starting address is 0. The MODBUS parameters of counter please refer to appendix <u>4.1.4.4 RTU counter settings</u>.

Eg:

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Read counter value, command as following:

01 03 00 00 00 02 C4 0B

Parse command:

Byte-	1	2	3	4	5		6	7	8
orders									
Content	01	03	00	00	00		02	C4	0B
Parsing	Slave	Functio	Start addr	numb	number of		checksum		
	address	n code		Regist	ters				
Meanin	01	Read	Address	(Count	ounter value is a		checksum	
g		holding	corresponding to		32 1	32 bit value, so,			
		register	counter		need t	need to read two 16			
						bit regiesters			

Response

01 02 01 00 A1 88

Parse response:

Byte-	1	2	3	4	5	6	7	8
orders								
Content	01	03	00	00	00	02	C4	0B
Parsing	Slave	Functio	High 16 l	oits of the	Low 16 bits of the		Checksum	
	address	n code	value		value			
Meanin	01	Read	Correspor	nding to	Correspor	ndint to	checksum	
g		holding	high 16	bits of	low 16	bits of		
		register	counter va	alue	counter va	alue		

Set counter initial value, command as following:

01 10 00 00 00 02 04 00 00 00 0A 73 A8

Parse command:

Byte-	1	2	3	4	5	6	7	8	9
orders									
Conten	01	10	00	00	00	02	04	00	00
t									
Parsing	Slave	Functi	Start address		Number	of	c	High	16 bits
	address	on			Registers			value	
		code							
Meani	01	Preset	Address	0	Counter	value is	Byte	Correspo	ond to
ng		multipl	correspon	nding to	32 bits,	so need	count	high 16	bits of
		e	counter		to write	two 16		counter	value
		register			bits regis	sters			
		S							

User Manual



User Manual

Contiune

10	11	12	13		
00	0A	73	A8		
Low 16 bits value		Checksum			
Correspond to low 16 bi	ts of counter value	checksum			

Response

01 10 00 00 00 02 41 C8

Parse response:

Byte-	1	2	3	4	5	6	7	8
orders								
Content	01	10	00	00	00	02	41	C8
Parsing	Slave	Functio	Start addr	ess	number of registers		Checksum	
	Address	n code						
Meanin	01	Preset	Address	0	Counter value is 32		checksum	L
g		multiple	correspon	corresponding to		need to		
		registers	counter		operate ty	operate two 16 bits		
					registers			

3.2.6 MODBUS analog input introduction

The MODBUS function code of analog input is 0x04(read input register), the starting address is 0, there are total 8 channels (the value of each channel is a signed 32-bit data, this data is the actual value of the sensor). The MODBUS parameters of analog input please refer to appendix <u>4.1.4.3</u> Analog input function.

Query all channels(all 8 channels) of analog input, command as following:

01	04	00	00	00	10	F1	C6

Parse command:

Byte-	1	2	3	4	5	6	7	8
orders								
Content	01	04	00	00	00	10	F1	C6
Parsing	Slave	Functio	Start Address		number of registers		Checksum	
	Address	n code						
Meanin	01	Read	Address 0000-0010		Analog input value		checksum	
g		input	correspond to		is 32 bits, high 16			
		register	AIN1-AIN8		bits first. If read			
					one chai	nnel, this		
					parameter	should		
					be 0002			

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Response

Parse response:

Byte-	1	2	3	4	5	6	7
orders							
Content	01	04	20	00	00	01	82
Parsing	Slave	Function	Data	Data 1		Data 2	
	address	code	length				
Meaning	01	Read	Byte	Correspond	ling to high	Correspond	ling to low
		input	count	16 bits of f	irst channel	16 bits of f	irst channel
		register		value. Te va	alue of each	value. Te va	alue of each
				channel is	a signed	channel is	a signed
				32-bit data		32-bit data	

continue

8	9	10	11	 32	33	34	35	36	37
00	00	00	0C	 00	00	00	0C	B0	A2
Data 3		Data 4		 Data 15		Data 16		Checksu	ım
Corresp	onding	Corresp	onding	 correspo	onding	corresp	onding	checksu	m
to high	16 bits	to low	16 bits	to high	16 bits	to low	16 bits		
of	second	of	second	of	eighth	of	eighth		
channel	value.	channel	value.	channel	value.	channel	value.		
Te va	lue of	Te va	lue of	Te va	lue of	Te va	lue of		
each ch	annel is	each ch	annel is	each ch	annel is	each ch	annel is		
a signe	d 32-bit	a signe	d 32-bit	a signe	d 32-bit	a signe	d 32-bit		
data		data		data		data			

3.3 RTU extended protocol

RTU extended protocol has the following main functions:

- 1. Acquisition data(including analog input and digital input) are reported periodically.
- 2. Reporting mode can be selected. there are three reporting modes, including Network only, SMS only and Main network ,SMS as backup(it uses SMS. when network connection fail)
- 3. When reporting acquisition data failure, acquisition data are saved to 2M byte SPI nonvolatile flash which is saved forever even if the device powered off.
- 4. The data center can query acquisition data actively
- 5. It has counter function that the initial value of the counter can be configured, its realtime value can be queried
- 6. It provede the transparent transmission tunnel between the data center and the terminal

Xiamen Four-Faith Communication Technology Co.,Ltd.

Page 25 of 96



devices which connected to the RTU RS232/485 port. This function works same as our company's ip modem.

- 7. It has alarm function and the alarm information can be reported periodically(alarm trigger conditions can be configured independently).
- 8. It can be controlled to reboot from the remote side.
- 9. support remote configure the parameters
- 10. Local and remote upgrade the firmware.

Please refer to appendix 5.2 RTU center service.

3.4 Alarm function

Alarm informations can be reported through RTU extended protocol only, SMS only and both SMS and RTU extended protocol. When alarm informations are reported through SMS, alarm phone number and alarm content of each channel can be configured independently. detail description please refer to appendix <u>5.2.7 Alarm information</u>.

3.5 Multiply configure parameters

All the RTU parameters can be configured through RS232/RS485 SMS and RTU extended protocol. Please refer to appendix <u>chapter 4 configuration</u>.

3.6 Remote upgrade firmware

RTU can remote upgrade firmware through TCP or UDP. First put new firmware (the version should higher than the current software version) on RTU center software(its manual refer to 5.2 <u>RTU center service</u>) installation directory. then, configure upgraded parameters, these parameters can be configured by SMS or RTU extended protocol. When RTU received the valid upgrade parameters, it will upgrade the firmware automatically. Detail settings please refer to appendix 4.2.2.2 Overall setting by SMS or 5.10 Remote configure.



Chapter 4 Configuration

All the RTU settings can be configured through RS232/RS485, SMS and RTU extended protocol.

4.1 RS232/RS485 Configuration

Before configuration, It's necessary to connect the RTU with the configure PC by the shipped RS232 or RS232-485 cable as following.



4.1.1 Configuration introduction

There are two ways to configure the RTU:

Configuration software tool: All the settings are configured through the shipped software tool. It's necessary to have one PC to run this tool.

Extended AT command: All the settings are configured through AT command, so any device with serial port can configure it. Before configuration with extended AT command, you should make RTU enter configure state. The steps how to make RTU enter configure state, please refer to appendix appendix.

The following describes how to configure RTU with the configure software tool. At the same time, it gives out the corresponding AT command of each configuration item.



User Manual

4.1.2 Run the configure tool

rk State Swite	ch			Serial Params
 Config 	Communication	Reboot Enter Comm	unication State	COM: COM1 V Baudrate: 115200 V Parity: None V Close
put Info				IP Modem Config
Current Cor > Please Re-p	nfigure Tool Release Date bower IP Modem	e:2012-10-18***		Automatic loading parameter region
			~	
nctions				
Show Config	Show Bandrate	Auto Detect	Ver Info	
Signal Value	Factory Setting	Clear Output	Save Output	Save Load From IP Modem Power-Off

The "Serial Parameters" column shows the current serial port settings. To configure RTU, please choose the correct serial port which connects to RTU, and the baud-rate is 115200 with no parity, then open the serial port. If the button text is "Close", it shows the serial port now has been opened. If the text is "Open", you should open the port first. When the port opened, the "Output Info" column will display

"Port(COM1) Has Opened, Please Re-Power the RTU, Waiting RTU Enter Configure State..."



User Manual

4.1.3 Re-power RTU

/ork State Switch	Serial Params
Config Communication Reboot Enter Communication Sta	COM: COM1 V Baudrate: 115200 V Parity: None V Close
utput Info	IP Modem Configuration
Ru adcain8 alarm text: adcain8 alarm Ru adcain8 alarm NO:	🛆 🛛 Digital channel settings Optocoupler and relay settings 🛛 Analog channel setti
tu counter enable: 0 21. counter alarm enable: 0	Configuration Item Configuration Value
atu counter alarm text: counter alarm	Digital channel 1 Settings
Ru counter alarm NO: Ru counter upper value:4294967295	Digital input function: Enable
tu counter value: 0	MODBUS Logic corresponding 1-High level and 0.
tu counter way: 0 tu reprotitime: 0	Acquisition purpose: Querv
tu alarm upload type: 0	Acquisition interval(unit:1 10
tu alarm continue time: 0 tu alarm upload number: 0	Alarm trigger condition: Rising edge alarm
	Alarm content(less than 140 input io1 alarm
ĸ	Alarm Phone Number(less tha
PD:44.5000	Digital channel 2 Settings
PR:115200 K	Digital input function: Enable
	MODBUS logic corresponding 1-High level and O
MODE: TCPCON	Acquisition purpose: Query
к	Acquisition interval(unit:1 10
	Alarm trigger condition: Rising edge alarm
ACTI:AUTO K	Alarm content(less than 140 input io2 alarm
	Alarm Phone Number(less tha
	🔽 🗾 Digital channel 3 Settings
	Digital input function: Enable
unctions	MODBUS logic corresponding 1-High level and O 😒
Show Config Show Bandrate Auto Detect Ver Inf	
Signal Value Factory Setting Clear Output Save Out	ut Save Load From IP Modem Power-Off
Browse Save Config Load Cor	ig l

After Re-power RTU, The configure tool will make it enter configure state. At the same time, the software will load current settings from RTU and displays on the right configure columns. It's now ready to configure.



4.1.4 Configuration

4.1.4.1 Digital channel settings

Nork State Switch	Serial Parame
Config Communication Reboot Enter Communication Sta	COM: COM1 V Baudrate: 115200 V Parity: None V Close
Dutput Info	CIP Modern Configuration
Rtu adc ain8 alarm text: adc ain8 alarm Rtu adc ain8 alarm NO:	Digital channel settings Optocoupler and relay settings Analog channel settin
Rtu counter enable: 0 Rtu counter alarm enable: 0	Configuration Item Configuration Value 🔦
αtu counter alarm text: counter alarm Rtu counter alarm NO:	Digital channel 1 Settings
tu counter upper value: 4294967295	Digital input function: Enable
tu counter value: 0 tu counter way: 0	MODBUS logic corresponding 1-High level and O
tu reprot time: 0	Acquisition purpose: Query
tu alarm upload type: 0 tu alarm continue time: 0	Acquisition interval(unit:1 10
tu alarm upload number: 0	Alarm trigger condition: Rising edge alarm
к	Alarm content(less than 140 input io1 alarm
	Alarm Phone Number(less tha
PR:115200	Digital channel 2 Settings
к	Digital input function: Enable
	MODBUS logic corresponding 1-High level and O
MODE: TCPCON	Acquisition purpose: Query
n	Acquisition interval(unit:1 10
	Alarm trigger condition: Rising edge alarm
K	Alarm content(less than 140 input io2 alarm
	Alarm Phone Number(less tha
	Digital channel 3 Settings
	Digital input function: Enable
unctions	MODBUS logic corresponding 1-High level and O ⊻
Show Config Show Bandrate Auto Detect Ver Info	
Signal Value Factory Setting Clear Output Save Output	Save Load From IP Modem Power-Off
Browse Save Config Load Con	

All the RTU digital input settings are configured in this page. Counter and digital input channel 1 are the same pin, Therefore two functions can not be enabled at the same time.

• Digital input function

"Digital input function" is the global key of digital input enable or disable. Disable this item will make the digital input channel functions not work.

Command: AT+RTUINIOENy=x

Explanation: enable or disable switch of digital input

Parameter: y range 1~8, Corresponding to digital input channel $1 \sim 8$. x range $0 \sim 1$, 0 means disable, 1 means enable.

Example: AT+RTUINIOEN1=1



MODBUS logic corresponding function

"MODBUS logic corresponding function" control functions that whether digital input MODBUS function is opened and MODBUS logic(logic 1 or logic 0) correspond to digital input level(high level or low level). The digital input channel returns a fixed 0 when MODBUS query when close MODBUS function.

Command: AT+RTUINIOMBy=x

Explanation: MODBUS logic corresponding function

Parameter: y range 1~8, corresponding to digital input channel 1~8. x range 0-2, 0 means close MODBUS function, 1 mean 1-high level and 0-low level, 2 mean 0-high level and 1-low level.

Example: AT+RTUINIOMB1=0

Acquisition purpose

This function means acquisition purpose. It includes query, query and alarm, query and report and query, alarm and report functions.

Command: AT+RTUINIOFUNy=x

Explanation: acquisition purpose.

Parameter: y range $1 \sim 8$, corresponding to digital input $1 \sim 8$ channel. x range 0-4, 0 means query, 1 means query and alarm, 2 means query and report, 3 means query, alarm and report.

Example: AT+RTUINIOFUN1=1

Acquisition interval

This parameter determines the digital input acquisition cycle, The unit is 10ms (milliseconds). If this value is 0, it will close acquisition function.

Eg:

60 seconds: this parameter should be 6000.

Command: AT+RTUINIOTIMEy=x

Explanation: set acquisition interval.

Parameter: y range $1 \sim 8$, corresponding to digital input channel $1 \sim 8$. x range 0-4294967295, 0 means close acquisition function.

Example: AT+RTUINIOTIME1=6000



Alarm trigger condition

It will alarm if digital input match this condition.

Command: AT+RTUINIOLRMOPy=x

Explanation: alarm tigger conditon.

Parameter: y range $1 \sim 8$, corresponding to digital input channel. x range $0 \sim 4$, 0 means low level, 1 means high level, 2 means rising edge, 3 means falling edge, 4 means both edge.

Example: AT+RTUINIOLRMOP1=0

Alarm content

Alarm SMS content configuration

Command: AT+RTUINIOLRMTXTy=xxx

Explanation: set alarm content.

Parameter: y range $1 \sim 8$, corresponding to digital input channel $1 \sim 8$. xxx means alarm content(<=140 bytes).

Example: AT+RTUINIOLRMTXT1= input io1 alarm

Alarm phone number

When RTU alarm, it will send sms to configured phone numbers.

Command: AT+RTUINIOADDLRMNOy=xxx

Explanation: add alarm phone number.

Parameter: y range $1 \sim 8$, corresponding to digital input channel $1 \sim 8$. xxx means alarm phone number(can configure multiple phone numbers, the numbers are separated by comma,total numbers should not exceed 7).

Example: AT+RTUINIOADDLRMNO1=13912345678,13812345678

Command: AT+RTUINIOSETLRMNOy=xxx

Explanation: set alarm phone number, The old alarm phone numbers will be overwrited when use this command.

Parameter: y range $1 \sim 8$, corresponding to digital input channel $1 \sim 8$. xxx means alarm phone number(can configure multiple phone numbers, the numbers are separated by comma,total numbers should not exceed 7).

Example: AT+RTUINIOSETLRMNO1=13912345678,13812345678

Command: AT+RTUINIODELLRMNOy=xxx

Xiamen Four-Faith Communication Technology Co., Ltd.

Page 32 of 96



Explanation: delete alarm phone number, it delets this number from the current alarm numbers.

Parameter: y range $1 \sim 8$, corresponding to digital input channel $1 \sim 8$. xxx means alarm phone number(can configure multiple phone numbers, the numbers are separated by comma,total numbers should not exceed 7).

Example: AT+RTUINIODELLRMNO1=13912345678,13812345678

4.1.4.2 Optocoupler and relay settings

Vork State Switch		Serial Params		
Config Communication Reboot Enter Communication	n State	СОМ: СОМ1 💽 В	Baudrate: 115200	V Parity: None V Close
utput Info		IP Modern Configuration		
रोu adc ain8 alarm text: adc ain8 alarm रोu adc ain8 alarm NO:	^	Digital channel settings	ptocoupler and relay	settings Analog channel setti
Ru counter enable: 0 Ru counter alarm enable: 0		Configuration It	em	Configuration Value 🛕
tu counter alarm text: counter alarm Ru counter alarm NO:		Optocoupler 1 Se	ttings	
tu counter upper value: 4294967295		Digital output f	unction:	Enable
tu counter value: U tu counter wav: 0		MODBUS logic 1 o	utput:	Highe level 📃
tu reprot time: 0		MODBUS logic O o	utput:	Low level
tu alarm upload type: U tu alarm continue time: 0		MODBUS logic 1 s	quare-wave	0
tu alarm upload number: 0		MODBUS logic O s	quare-wave	0
к		Default output v	oltage:	Low level
		Optocoupler 2 Se	ttings	
PR:115200		Digital output f	unction:	Enable
к		MODBUS logic 1 o	utput:	Highe level
		MODBUS logic O o	utput:	Low level
MODE:TCPCON		MODBUS logic 1 s	quare-wave	0
ĸ		MODBUS logic O s	quare-wave	0
		Default output v	oltage:	Low level
ACTEAUTO K		Optocoupler 3 Se	ttings	
		Digital output f	unction:	Enable
	~	MODBUS logic 1 o	utput:	Highe level
		MODBUS logic O o	utput:	Low level
inctions		MODBUS logic 1 s	quare-wave	0
Show Config Show Bandrate Auto Detect Ve	er Info			<u> </u>
Signal Value Factory Setting Clear Output Save	e Output	Save	Load From IP Mo	dem Power-Off
Browse Save Config Load	d Config			

• Digital output function

It controls digital output ports(4 optocouplers ports and 4 relay outputs). Its function includes MODBUS control and RTU extended protocol control.

Command: AT+RTUOUTIOENy=x

Explanation: digital output function.

Parameter: y range $1\sim8$, corresponding to digital output channels($1\sim4$ corresponding to optocouplers channel $1\sim4$, $5\sim8$ corresponding to relay outputs $1\sim4$). x range 0-1, 0 means disable, 1 means enable.

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Page 33 of 96



Example: AT+RTUOUTIOEN1=1

MODBUS logic 1 output

Please refer to appendix 3.1.4 MODBUS digital output, Register value FF00 means logic 1. This item configure digital output status when outputting logic 1.

Command: AT+RTUOUTIOONEy=x

Explanation: MODBUS logic 1 output.

Parameter: y range $1 \sim 8$, corresponding to digital output channels($1 \sim 4$ mean optocouplers channel $1 \sim 4$, $5 \sim 8$ corresponding to relay outputs $1 \sim 4$).

Optocouplers output: x range 0-5, 0 means low level, 1 means high level. 2 means rising edge, 3 means falling edge, 4 means both edge. 5 means square wave.

Relay output: x range 0-1, 0 mean disconnet, 1 mean connect.

Example: AT+RTUOUTIOONE1=1

MODBUS logic 0 output

Please refer to appendix 3.1.4 MODBUS digital output, register 0000 mean logic 0. This item configure digital output status when outputting logic 0.

Command: AT+RTUOUTIOZEROy=x

Explanation: MODBUS logic 0 output.

Parameter: y range $1 \sim 8$, corresponding to digital output channels($1 \sim 4$ mean optocouplers channel $1 \sim 4$, $5 \sim 8$ corresponding to relay outputs $1 \sim 4$).

Optocouplers output: x range 0-5, 0 means low level, 1 means high level. 2 means rising edge, 3 means falling edge, 4 means both edge. 5 means square wave.

Relay output: x range 0-1, 0 mean disconnet, 1 mean connect.

Example: AT+RTUOUTIOZERO1=1

♦ MODBUS logic 1 square-wave cycle

This item configure square wave cycle when MODBUS logic 1 is configured as square wave output. The unit is 20ms(milliseconds). for expande: 50 means 50 * 20ms = 1s(seconds).

Command: AT+RTUOUTIOONEFREQy=x

Explanation: MODBUS logic 1 square wave cycle.

Parameter: y range $1\sim4$, corresponding to digital output channels($1\sim4$ corresponding to optocoupler ports $1\sim4$). x range 0-4294967295.

Example: AT+RTUOUTIOONEFREQ1=50

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◆ MODBUS logic 0 square-wave cycle

This item configure square wave cycle when MODBUS logic 0 is configured as square wave output. The unit is 20ms(milliseconds). for expanse: 50 means 50 * 20ms = 1s(seconds).

Command: AT+RTUOUTIOZEROFREQy=x Explanation: MODBUS logic 0 square wave cycle. Parameter: y range 1~4, corresponding to digital output channels(1~4 corresponding to optocoupler ports 1~4). x range 0-4294967295. Example: AT+RTUOUTIOZEROFREQ1=50

-

Default output voltage

It controls default output voltage level when RTU powered on.

Command: AT+RTUOUTIODEFVALy=x

Explanation: set default output voltage.

Parameter: y range $1 \sim 8$, corresponding to digital output channels($1 \sim 4$ means optocoupler channel $1 \sim 4$, $5 \sim 8$ means relay output $1 \sim 4$).

Optocoupler output: x range 0-1, 0 means low level, 1 means high level.

relays: x range 0-1, 0 means disconnet, 1 means connect.

Example: AT+RTUOUTIODEFVAL1=1



4.1.4.3 Analog channel settings

Nork State Switch	Serial Params	
Config Communication Reboot Enter Communication S	te COM: COM1 V Baudrate: 115200	Parity: None V Close
Dutput Info	IP Modem Configuration	
Rtu adcain8 alarm text: adcain8 alarm Rtu adcain8 alarm NO: Rtu actoain8 alarm NO:	Optocoupler and relay settings Analog cha	nnel settings RTU counter、 repo <
rtu counter enable: U Rtu counter alarm enable: O	Configuration Item	Configuration Value
tu counter alarm text: counter alarm	Analog channel 1 Settings	
tu counter alami No. tu counter upper value: 4294967295	Analog input function:	Enable
tu counter value: 0	Decimal point digits:	0
au counter way. 0 Au reprot time: 0	Top range:	5120
tu alarm upload type: 0	Low range:	0
au aiarm continue time: 0 Rtu aiarm upload number: 0	Top alarm limit:	5120
	Low alarm limit:	0
JK	Analog signal types:	0-5.12V
100-44/2000	Top range corresponding to	. 5120000
HPR:115200 DK	Low range corresponding to	. 0
	MODBUS function:	Enable
+MODE:TCPCON	Acquisition function:	Query
ж	Acquisition interval (10mS) :	10
	Alarm trigger condition:	Below the lower li
+ACTI:AUTO	Alarm content:	adc ain1 alarm
UK .	Alarm Phone Number:	
	Analog channel 2 Settings	
	Analog input function:	Enable
unctions	Decimal point digits:	0
Show Config Show Bandrate Auto Detect Ver Ir		E4 00
Signal Value Factory Setting Clear Output Save O	put Save Load From IP	Modern Power-Off
Browse Save Config Load Co	nfig	

Analog input function

Enable or disable analog input function.

Command: AT+RTUADCENy=x

Explanation: enable or disable analog iput function.

Parameter: y range $1 \sim 8$, corresponding to analogl input channel $1 \sim 8$. x range 0-1, 0 means disable, 1 means enable.

Example: AT+RTUADCEN1=1

♦ Set sensor range

For example: There is a temperature sensor that the measuring range is $-40.5 \sim 50.5$ °C and output votage $1.3 \sim 4.5$ V. This sensor connect to RTU first analog input channel. The decimal point of the data is three. temperature that is higher than 39.9°C lower than -20.5°C should alarm. The parameter settings should as following.


Decimal point digits:	3
Top range:	50500
Low range:	-40500
Top alarm limit:	39900
Low alarm limit:	-20500
Analog signal types:	0-5.12V
Top range corresponding to	4500000
Low range corresponding to	1300000
MODBUS function:	Enable
Acquisition function:	Querys Alarm And R
Acquisition interval (10mS) :	10
Alarm trigger condition:	Not Between lower

The range settings and alarm limit settings should take care of the decimal point digits setting. "Analog signal types" used for configure analog signal type(voltage or current). If the type is voltage, "Top range corresponding to voltage(uV) or Current output (nA)" is 4500000, This means 4500000 V = 4.5 V, "Low range corresponding to voltage(uV) or Current output (nA)" is the same. If the type is current, "Top range corresponding to voltage(uV) or Current output (nA)" is 4500000, This means 4500000 A = 4.5 mA, "Low range corresponding to voltage(uV) or Current output (nA)" is 4500000, This means 4500000 A = 4.5 mA, "Low range corresponding to voltage(uV) or Current output (nA)" is 4500000.

Command: AT+RTUADCDECIMALy=x

Explanation: set the number of decimal point.

Parameter: y range $1 \sim 8$, corresponding to analogl input channel $1 \sim 8$. x range 0-255, number of decimal point, 0 mean no decimal point, 1 mean one decimal point.

Example: AT+RTUADCDECIMAL1=0

Command: AT+RTUADCFULLVALy=x

Explanation: set top range(the value can be negative).

Parameter: y range $1 \sim 8$, corresponding to analogl input channel $1 \sim 8$. x range -2147483648 to 2147483647, this value related to the decimal point.

Example: AT+RTUADCFULLVAL1=100

Example: AT+RTUADCFULLVAL1=-100

Command: AT+RTUADCZEROVALy=x

Explanation: set low range(the value can be negative).

Parameter: y range $1 \sim 8$, corresponding to input channel $1 \sim 8$. x range -2147483648 to 2147483647, its value related to the decimal point.

Example: AT+RTUADCZEROVAL1=100

Example: AT+RTUADCZEROVAL1=-100

Command: AT+RTUADCLOWERVALy=x



	Explanation	set low alarm limitation(the value can be negative).
	Parameter:	y range 1~8, corresponding to analogl input channel 1~8. x range -2147483648
to 2	147483647,	its value related to the decimal point.
	Example:	AT+RTUADCLOWERVAL1=100
	Example:	AT+RTUADCLOWERVAL1=-100
	Command:	AT+RTUADCUPPERVALy=x
	Explanation	set top alarm limitation(the value can be negative).
	Parameter:	y range 1~8, corresponding to analogl input channel 1~8. x range -2147483648
to 2	147483647,	its value related to the decimal point.
	Example:	AT+RTUADCUPPERVAL1=100
	Example:	AT+RTUADCUPPERVAL1=-100

Set sensor voltage or current output

Analog signal types:	0-5. 12V
Top range corresponding to	4500000
Low range corresponding to	1300000
Please refer to appendix "Set sensor r	ange".

Command: AT+RTUADCINTYPEy=x

Explanation: set the analog signal input type(voltage or current).

Parameter: y range $1 \sim 8$, corresponding to analogl input channel $1 \sim 8$. x range 0-1, 0 means 0-5.12V,the type is voltage, 1 means 0-20mA,the type is current.

Example: AT+RTUADCDECIMAL1=0

Command: AT+RTUADCFULLVORAy=x

Explanation: the top range of sensor outputs voltage or current value.

Parameter: y range $1 \sim 8$, corresponding to analog input channel $1 \sim 8$. x range 0-4294967295.

Example: assume the analog signal type is voltage. AT+RTUADCFULLVORA1=1000000 (1V)

Command: AT+RTUADCZEROVORAy=x

Explanation: the low range of sensor outputs voltage or current value.

Parameter: y range $1 \sim 8$, corresponding to analog input channel $1 \sim 8$. x range 0-4294967295, it related to the sensor ouput type

Example: assume the analog signal input type is current.

AT+RTUADCZEROVORA1=1000000 (1mA)



MODBUS function

"MODBUS function" control analog input MODBUS function. If disable this function, this analog input channel returns a fixed 0 when MODBUS query.

Command: AT+RTUADCMBENy=x

Explanation: MODBUS fuctions of analog input.

Parameter: y range $1 \sim 8$, corresponding to analogl input channel. x range $0 \sim 1$, 0 means disable, 1 means enable.

Example: AT+RTUADCMBEN1=1

♦ Acquisition function

This item control analog input alarm and active report function.

Command: AT+RTUADCFUNy=x

Explanation: acquisition purpose.

Parameter: y range $1 \sim 8$, corresponding to analog input $1 \sim 8$ channel. x range 0-4, 0 means query, 1 means query and alarm, 2 means query and report, 3 means query, alarm and report.

Example: AT+RTUADCFUN1=1

Acqisition interval

This parameter control the analog input acquisition cycle, The unit is 100ms (milliseconds). If this value is 0, it will close acquisition function.

example:

this parameter is 600 means: 600*100ms=60 seconds

Command: AT+RTUADCTIMEy=x

Explanation: set analog input acquisition interval.

Parameter: y range $1 \sim 8$, corresponding to analog input channel $1 \sim 8$. x range 0-4294967295, 0 means close acquisition function.

Example: AT+RTUADCTIME1=1

Alarm trigger condition

It will alarm if analog input match this condition.

Command: AT+RTUADCLRMOPy=x

Explanation: alarm tigger conditon.

Parameter: y range 1~8, corresponding to analog input channel 1~8.

x range 0-4

- 0: less than low alarm limit will alarm.
- 1: mean greater than top alarm limit will alarm
- 2: greater than low alarm limit and less than top alarm limit will alarm
- 3: less than low alarm limit or greater than top alarm limit will alarm

Example: AT+RTUADCLRMOP1=0

Alarm content

When analog input alarming, RTU will send SMS. The SMS content configured by this item.

Command: AT+RTUADCLRMTXTy=xxx

Explanation: set analog input alarm content.

Parameter: y range $1 \sim 8$, corresponding to analog input channel $1 \sim 8$. xxx means alarm content(<=140 bytes).

Example: AT+RTUADCLRMTXT1= adc ain1 alarm

Alarm phone number

when analog input alarming, RTU will send SMS to these numbers.

Command: AT+RTUADCADDLRMNOy=xxx

Explanation: add analog input alarm phone numbers .

Parameter: y range $1 \sim 8$, corresponding to analog input channel $1 \sim 8$. xxx mean alarm phone number(its number is not more than 7).

Example: AT+RTUADCADDLRMNO1=13912345678,13812345678

Command: AT+RTUADCSETLRMNOy=xxx

Explanation: set alarm phone number, it delets alarm phone number that has setted.

Parameter: y range 1-8, it is analog input channel. xxx mean alarm phone number(can configure multiple phone numbers, the numbers are separated by comma,total numbers should not exceed 7).

Example: AT+RTUADCSETLRMNO=13912345678,13812345678

Command: AT+RTUADCDELLRMNOy=xxx

Explanation: delete analog input alarm phone numbers, it delets the matched phone numbers from the current number list.

Parameter: y range 1~8, corresponding to analog input channel 1~8. xxx mean alarm phone number to be deleted(can configure multiple phone numbers, the numbers are separated by Xiamen Four-Faith Communication Technology Co.,Ltd. Page 40 of 96 Add: J1-J3,3rdFloor,No.44,GuanRiRoad,SoftWare Park,XiaMen .361008.China



comma,total numbers should not exceed 7).

Example: AT+RTUADCDELLRMNO1=13912345678,13812345678

Active report function

It controls analog input acquisition active report function when use the extended RTU protocol.

Command: AT+RTUADCREPORTENy=x

Explanation: enable or disable analog input acquisition active report function.

Parameter: y range $1 \sim 8$, corresponding to analog input channel $1 \sim 8$. x range 0 - 1, 0 means disable, 1 means enable.

Example: AT+RTUADCREPORTEN1=0

.4.1.4.4 RTU counter、 report、 Alarm settings

😽 IP Modem Configure Tool V1.3.2	
Work State Switch Config Communication Reboot Enter Communication State	Com: Com: Com: Com: Close Clos
Oconfig Communication Rebude Enter Communication State Output Info Rtu adc ain8 alarm NO: Rtu counter alarm NO: Rtu counter alarm enable: 0 Rtu counter alarm enable: 0 Rtu counter alarm no: 0 Rtu counter alarm enable: 0 Rtu counter alarm no: 0 Rtu counter alarm NO: 0 Rtu counter alarm no: 0 0 0 Rtu counter alarm no: 0 0 0 Rtu counter value: 0 0 0 Rtu alarm upload fuge: 0 0 0 OK 0 0 0 0	COME COME Close IP Modem Configuration Analog channel settings RTU counters, report, Alarm settings ModBus Set! <> Counter Setting (counter and digital channel 1 can't work together at the s: Counter function: Disable Counter work mode: Rising edge Counter initial value: 0 Alarm content: counter alarm Alarm Number:
+IPR:115200 OK	Alarm upper limit: 4294967295
+MODE:TCPCON OK +ACTEAUTO OK	Active report interval(s): Alarm Setting: Alarm Setting: Alarm upload style: SMS Only Continuous alarm interval(s,0) means upload once): Continuous alarm number of times(0-255,0:disable,255: no unlimited): Alarm administrator
Show Config Show Bandrate Auto Detect Ver Info Signal Value Factory Setting Clear Output Save Output Browse Save Config Load Config	number(less than 20

All the RTU counter settings are configured in this page. Counter and digital input channel 1 are the same pin, Therefore two functions can not be enabled at the same time.

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Enable or disable counter function.

Command: AT+RTUCOUNTEREN=x Explanation: enable or disable counter function. Parameter: x range 0-1, 0 means disable, 1 means enable. Example: AT+RTUCOUNTEREN=1

Counter work mode

The counter value will add 1 when the input waveform match the configured condition. if configured as both edge, the counter value will add 1 when the input waveform level changes.

Command: AT+RTUCOUNTERWAY=x Explanation: set counter work mode. Parameter: x range 0~2, 0 means rising edge, 1 means falling edge, 2 means both edge. Example: AT+RTUCOUNTERWAY=1

• Counter initial value

It set counter initial value.

Command: AT+RTUCOUNTERVAL=x Explanation: set counter initial value. Parameter: x range0-4294967295. Example: AT+RTUCOUNTERVAL=0

♦ Alarm function

"Alarm funcion" control counter alarm function.

Command: AT+RTUCOUNTERLRMREN=x Explanation: enable or disable counter alarm function. Parameter: x range 0-1, 0 means disable, 1 means enable. Example: AT+RTUCOUNTERLRMREN=0



♦ Alarm content

When counter alarming, RTU will send SMS. This item configure the SMS content.

Command: AT+RTUCOUNTERLRMTXT=xxx Explanation: set counter alarm content. Parameter: xxx mean counter alarm content(<=140 bytes). Example: AT+RTUCOUNTERLRMTXT=counter alarm

Alarm phone number

when RTU counter alarm, RTU will send sms to these numbers.

Command: AT+RTUCOUNTERADDLRMNO=xxx

Explanation: add alarm phone numbers.

Parameter: xxx means counter alarm phone numbers(can configure multiple phone numbers, the numbers are separated by comma,total numbers should not exceed 7).

Example: AT+RTUCOUNTERADDLRMNO=13912345678,13812345678

Command: AT+RTUCOUNTERSETLRMNO=xxx

Explanation: set counter alarm phone numbers, it delete the old alarm phone number list and save with this new phone number list.

Parameter: xxx means counter alarm phone numbers(can configure multiple phone numbers, the numbers are separated by comma,total numbers should not exceed 7).

Example: AT+RTUCOUNTERSETLRMNO=13912345678,13812345678

Command: AT+RTUCOUNTERDELLRMNO=xxx

Explanation: delete counter alarm phone number, it delete the matched phone number from the phone number list.

Parameter: xxx mean alarm phone numbers(can configure multiple phone numbers, the numbers are separated by comma,total numbers should not exceed 7).

Example: AT+RTUCOUNTERDELLRMNO=13912345678,13812345678

Alarm upper limit

Counter alarm when "Alarm function" enable and counter value is greater than this "Alarm upper limit" value.



Command:	AT+RTUCOUNTERUPVAL=x
Explanation:	set counter alarm upper limit.
Parameter:	x range0-4294967295.
Example:	AT+RTUCOUNTERUPVAL=0

• Active report interval

In RTU extended protocol, if "Active report function" enable. The RTU will report acquisition data according to this time interval(unit: second). If RTU report acquisition data failed, then it will retransmit the data after 30 seconds, it will keep trying until server received successfully. If this parameter is zero, RTU will stop active report function.

Command: AT+RTUREPORTTIME=x Explanation: active report interval. Parameter: x range 0-4294967295, unit is second, 0 means disable Example: AT+RTUREPORTTIME=1

◆ Alarm report method

When RTU alarm , alarm informations are transmitted to the user by this configured report method.

SMS Only: alarm informations are transmitted to the user by only SMS.

Protocol Only: alarm informations are transmitted to the user by only RTU extended protocol.

Protocol and SMS: alarm informations are transmitted to the user by both SMS and RTU extended protocol.

Command: AT+RTULRMUPLOADE=x

Explanation: alarm report method.

Parameter: x range 0-2, 0 means SMS only, 1 means protocol only, 2 means both SMS and protocol.

Example: AT+RTULRMUPLOADE=1

• Continuous alarm interval

When RTU continued alarm, The RTU will continuously report the alarm information according to this alarm interval until the alarm condition not match the configured alarm condition. If this parameter configured as zero, RTU report alarm information only once.

Command: AT+RTULRMTIME=x



Explanation: continuous alarm interval.

Parameter: x range 0-4294967295, 0 mean report alarm information once, others mean continued alarm interval.

Example: AT+RTULRMTIME=1

• Continuous alarm number of times

This parament should be used together with he parament of "Continuous alarm interval". It use to limit the continuous alarm number of times. 0 means not continuous alarm, 255 means not limit the continuous alarm number of times.

Command: AT+RTULRMNUM=x

Explanation: continuous alarm number of times.

Parameter: x range 0-255, 0 mean not continuous alarm, 255 means not limit the continuous alarm number of times, others mean continued alarm number of times.

Example: AT+RTULRMNUM=1

♦ Alarm administrator number

When RTU alarm and report by sms way, all alarm informations are transmitted to these numbers.

Command: AT+RTUADDADMINNO=xxx

Explanation: alarm administrator number, .

Parameter: xxx mean alarm phone numbers(can configure multiple phone numbers, the numbers are separated by comma,total numbers should not exceed 7).

Example: AT+RTUADDADMINNO=13912345678,13812345678

Command: AT+RTUSETADMINNO=xxx

Explanation: set alarm administrator number, it delete the old alarm phone number list and save with this new one.

Parameter: xxx means alarm phone number(can configure multiple phone numbers, the numbers are separated by comma,total numbers should not exceed 7).

Example: AT+RTUSETADMINNO=13912345678,13812345678

Command: AT+RTUDELADMINNO=xxx

Explanation: delete alarm administrator numbers, it delete the matched alarm phone number from the phone number list.

Parameter: xxx means alarm phone numbers(can configure multiple phone numbers, the numbers are separated by comma,total numbers should not exceed 7).

Example: AT+RTUDELADMINNO=13912345678,13812345678

Page 45 of 96



4.1.4.5 ModBus Setting

〒 IP Modem Configure Tool ¥1.3.2		
Work State Switch Config Communication Reboot Enter Communication State	Serial Params COM: COM1 V Baudrate: 11	5200 V Parity: None V Close
	- IP Modem Configuration	
Rtu adc ain8 alarm text: adc ain8 alarm Rtu adc ain8 alarm NO: Rtu counter enable: 0 Rtu counter alarm enable: 0	RTU counter、 report、 Alarm settings	ModBus Setting Data Service Center
Rtu counter alarm text: counter alarm Rtu counter alarm NO: Rtu counter upper value: 4294967295	ModBus work mode:	Disable MODBUS
Rtu counter value: 0 Rtu counter way: 0 Rtu reprot time: 0 Rtu elemu prioad tune: 0	ModBus address<1-247>:	1
Rtu alarm continue time: 0 Rtu alarm upload number: 0	RTU work mode:	Modual
ок		
+IPR:115200 OK		
+MODE:TCPCON OK		
+ACTI:AUTO OK		
-Functions		
Signal Value Factory Setting Clear Output Save Output	Save Load Fr	rom IP Modern Power-Off
Browse Save Config Load Config		

ModBus work mode

"ModBus Work mode" used for configuring the RTU work mode. There are the following options: Disable MOBUS: disable MODBUS function

Network RTU: RTU uses TCP to virtual serial port convert software to support MODBUS RTU protocol(the data transmitted over ip network).

Serial Port RTU: RTU uses RS232/RS485 to support MODBUS RTU protocol.

Command: AT+MBMODE=x

Explanation: set MODBUS functions work mode.

Parameter: x range 0-2, 0 means Disable MOBUS, 1 means Network RTU, 2 means Serial Port RTU.

Example: AT+MBMODE=1



ModBus address

It sets MODBUS device address of this RTU, server identify devices based on this address.

Command: AT+MBADDRESS=x Explanation: set MODBUS device address. Parameter: x range 1-247. Example: AT+MBADDRESS=1

RTU work mode

This item configure whether the RTU has wireless module, if there is no wireless module , the network and SMS function will not work, in this circumstance , the RTU work as a standard serial RTU device.

Command:AT+RTUWRKMDE=xExplanation:set RTU work mode.Parameter:x range 0-1, 0 mean no wireless module, 1 mean has wireless module.Example:AT+RTUWRKMDE=1



4.1.4.6 Data Service Center Settings

Vork State Switch		Serial Params				
Config Communication Reboot Enter Communication	on State	COM: COM1 🔽 Bau	drate: 115200	Parity:	None 🔽 🖸	lose
utput Info		IP Modem Configuration				
Rtu adc ain 8 alarm text: adc ain 8 alarm Rtu adc ain 8 alarm NO:	<u>^</u>	ModBus Setting Data Service	e Center Settings	^o Modern Sel	tting Other Sett	< >
tu counter enable: 0 Nu counter elava eschlar, 0		Data Service Center Settin	ngs:			
tu counter alarm enable. o tu counter alarm text: counter alarm		Data Center Number:		1	*	
Ru counter alarm NO: Ru counter upper value: 4294967295		Main Center Addr+Port:	120.42.46.98	5001	Extend RT	J 🗸
tu counter value: 0		Backup Center:	www.four-faith.co	ır 80		
tu reprot time: 0		2nd Center Addr+Port:	166.111.8.238	23	Extend RT	J 🗸
ttu alarm upload type: 0 ttu alarm continue time: 0		3nd Center Addr+Port:	166.111.8.238	23	Extend RT	J 🗸
Ru alarm upload number: 0		4nd Center Addr+Port:	166.111.8.238	23	Extend RT	J 🗸
ЭК		5nd Center Addr+Port:	166.111.8.238	23	Extend RTU	J 🗸
HPR:115200						
ж		- DNS Server				
MODE:TCPCON		Main Center DNS Serv	er: 8	. 8 .	8.8	
ЭК		Backup Center DNS S	erver: 8	. 8 .	8.8	
ACTI: AUTO		2nd Center DNS Serve	er: 8	. 8 .	8.8	
ж		3nd Center DNS Serve	er: 8	. 8 .	8.8	
	~	4nd Center DNS Serve	er: 8	. 8 .	8.8	
		5nd Center DNS Serve	er: 8	. 8 .	8.8	
Show Contig Show Bandrate Auto Detect V	erinfo					
Signal Value Factory Setting Clear Output Sav	e Output	Save	Load From IP Mode	m Por	wer-Off	
Browse Save Config Loa	d Config					

Settings on this page are the parameters related to Data Service Center (DSC).

◆ Data Center Number

RTU support two Data Service Center (abbreviation: DSC)methods to transmit data.

Main and Backup: RTU always tries to connect with the Main DSC. If fails to connect with Main DSC, it will connect with Backup DSC at once

Note: If no Backup DSC exists, please configure the Backup DSC same as Main DSC.

Multi Data Service Center: RTU can connect with at most five DSC at the same time. All the multi DSC can receive the same application data .

If the Data Center Number is 0,there is no DSC working. If the Data Center Number is 1, RTU work in Main and Backup DSC mode. When "Data Center Number" is greater than 1, RTU works in Multi Data Service Center mode

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GPS data transmission DSC is self-governed. Setting details please reference the section 3.5.5.

AT command: AT+SVRCNT=x x: Data Service Center number Note: every AT command is terminated with a enter character.

Main Center Addr+Port:

Main Center Addr+Port:	120.42.46.98	5001	Extend RTU	~		
------------------------	--------------	------	------------	---	--	--

IP Address and Port of the Main DSC, It's better to set the port greater than 1024.

Main and backup center function: it means the function of this center. RTU connect this center by TCP or Udp that is selected by 4.1.4.7 work mode.

MODBUS: RTU uses TCP to virtual serial port convert software to support MODBUS RTU protocol.

extend RTU: RTU and center have the function of RTU extended protocol. You need to select this function, when you use the RTU server software which our company provided.

AT command of the Main DSC IP address or domain name: AT+IPAD=xxx xxx: The IP address or domain name of the main server.

AT command of the Main DSC port: AT+PORT=xxx xxx: The main server port

AT command of this connection protocol type: AT+SOCKETFUN1=x x range 10-11, 10 mean MODBUS, 11 means RTU extended protocol.

Backup Center Addr+Port:

Backup Center: www.four-faith.cor 80

IP address and port of the Backup DSC

AT command of the Backup DSC IP address or domain: AT+IPSEC=xxx xxx: The IP address or domain name

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Page 49 of 96



AT command of the Backup DSC port: AT+PTSEC=xxx xxx: The port value

Multi DSC Configuration

2nd Center Addr+Port:	166.111.8.238	23	Extend RTU 🗸
3nd Center Addr+Port:	166.111.8.238	23	Extend RTU 🗸
4nd Center Addr+Port:	166.111.8.238	23	Extend RTU 🗸
5nd Center Addr+Port:	166.111.8.238	23	Extend RTU 🗸

When "Data Center Number" is greater than 1, this setting is valid. For example, setting the "Data Center Number" as 3, Main Center, 2nd Center, 3rd Center work as these three DSC

Multi center function: it means the function of this center. RTU connect this center by TCP or Udp that is selected by 4.1.4.7 work mode.

MODBUS: RTU uses TCP to virtual serial port convert software to support MODBUS RTU protocol.

extend RTU: RTU and center have the function of RTU extended protocol. You need to select this function, when you use the RTU server software which our company provided.

AT Command of the 2~5 DSC IP address or domain name AT+IPADn=xxx n is 1~4 correspond to center 2~5 xxx: The IP address or domain name

AT Command of the 2~5 DSC port AT+PORTn=xxx n is 1~4 correspond to port of center 2~5 xxx: The port value

AT command of the center protocol type: AT+SOCKETFUNn=x n range 2-5, corresponding to the center 2 to center 5. x range 10-11, 10 means MODBUS, 11 means RTU extended protocol.

Example:

Set IP address of center 3 as 166.111.8.238, and port 5001, the AT command is as following:





AT+IPAD2=166.111.8.238 AT+PORT2=5001

• Main and Backup Center DNS Server

Main Center DNS Server:	8	8	8	8
Backup Center DNS Server:	8	8	8	8

When the DSC Internet access uses domain name, It's necessary to set DNS server resolving the DSC domain name. When the Data Center Number is 1, Main and Backup Center DNS Server is used to resolve the Main center and Backup center correspondingly.

AT command of Main Center DNS server: AT+DNSSVR=aaa.bbb.ccc.ddd aaa.bbb.ccc.ddd: The DNS server IP address(must be IP address).

AT command of Backup Center DNS server: AT+DNSSV2=aaa.bbb.ccc.ddd aaa.bbb.ccc.ddd: the DNS server IP address

• Center 2~5 DNS Server

2nd Center DNS Server:	8	8	8	8	
3nd Center DNS Server:	8	8	8	8	
4nd Center DNS Server:	8	8	8	8	
5nd Center DNS Server:	8	8	8	8	

When the RTU work in Multi Data Service Center method and the centers use domain name, $2\sim5$ DNS server is used to resolve center $2\sim5$ correspondingly.

AT command of 2~5 DNS Server AT+DNSSVRn=aaa.bbb.ccc.ddd n is 1~4 correspond to center 2~5 DNS server. aaa.bbb.ccc.ddd is the DNS server IP address



4.1.4.7 Device Settings

Vork State Switch	Serial Params	
Config Communication Reboot Enter Communication State	COM: COM1 V Baudrate: 115200	Parity: None Close
Dutput Info	IP Modem Configuration	
Rtu adc ain8 alarm text: adc ain8 alarm 🔥 🧑	ModBus Setting Data Service Center Settings	IP Modern Setting Other Setti
Rtu counter enable: 0 Rtu counter alarm enable: 0	WorkMode:	TCPCON
Rtu counter alarm text. Counter alarm Rtu counter alarm NO:	Trigger Type(Default Auto):	AUTO 🔽
Rtu counter upper value: 4294967295 Rtu counter value: 0	Disconnect to Trigger Mode:	Disable 😽
Rtu counter way: 0 Rtu reprot time: 0	Debug Level(0/1/2):	1
Rtu alarm upload type: 0 Rtu alarm continue time: 0	Databit, Parity, Stopbit:	8N1 🗸
Rtu alarm upload number: 0	Communication Baudrate:	115200
ок	Offline detect interval:	0
JDP-115200	Auto Back To Main Server:	0 🖌
ок	(110-Yes/No) Device ID(8 Bytes Hex-Decimal):	74736574
MODE TODOON	SIM Card No(11 Bytes):	13912345678
+MODE:TCPCON OK	Bytes Interval(Default 20ms):	20
	Custom Register String:	
+ACTI:AUTO OK	Custom Heartbeat String:	
	Connect Retry Times(2-65535):	8640
<u>×</u>	Reconnect Time	10
unctions	Transfer Meaning(0/1-Yes/No):	0
Signal Value Factory Setting Clear Output Save Output Browse Save Config Load Config	Save Load From IP Mo	dem Power-Off

• Work Mode

WorkMode:	TCPCON	~

RTU: According to different application requirements, there are several protocol workmode to choose.

TRNS: RTU work as a common GPRS MODEM, It can be used in SMS, CSD, Dial-up applications.

TCPCON: All data interaction based on the TCP link. UDPCON: All data interaction based on the UDP link.

AT command: AT+MODE=xxxx xxxx: one of the above workmode





Trigger Type(Default Auto):	AUTO	×

Normally, RTU always keeps online and always be ready for data transmission. But in some circumstances, it's important to reduce wireless data flow. To realize this function, the software can makes RTU into sleep state in idle time. When there is application data to transmit, RTU can be triggered online ready for data transmission. There are total five methods to make RTU online:

AUTO: RTU always keeps online
SMSD: send a special short message to make RTU online
CTRL: make RTU online through a phone call to RTU
DATA: send special serial data to make RTU online
MIXD: the combination of SMSD, CTRL, DATA. RTU will be online when meet one of these three trigger methods.

AT Command: AT+ACTI=xxxx xxxx: one of the above trigger methods

Disconnect to Trigger mode

Disconnect to Trigger Mode: Disable 👻

When RTU enable trigger mode, and enable "Disconnect to Trigger mode" function. The RTU will re-enter trigger mode when it connect to the network fail or the network connection broken. This will make RTU enter into sleep state.

AT Command: AT+ISTRIGMODE=x x range 0-1, 0 means disable, 1 means enable



Debug Level (0/1/2) :

Debug information is used to debug software when there is software problem.

0 --- no debug information output

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 Page 53 of 96

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1 --- simple prompt information output

2 --- detail debug information output

AT Command: AT+DEBUG=x x: the debug level value

Note: Only there is some problem to the RTU, It's necessary to set this value as 2, In normal applications, this value should set to 0 or 1, the default value is 1.



Databit, Parity, Stopbit:8N18N1 ----8 Databit, No parity, 1 Stopbit8E1 ----8 Databit, Even parity, 1 Stopbit8O1 ----8 Databit, Odd parity, 1 StopbitAT Command:AT+SERMODE=xxx

xxx: one of the above serial mode

• Communication Baudrate

Communica	tion Baudrate:	115200	•
110	110 bps		
300	300 bps		
600	600 bps		
1200	1200 bps		
2400	2400 bps		
4800	4800 bps		
9600	9600 bps		
14400	14400 bps		
19200	19200 bps		
38400	38400 bps		
56000	56000 bps		
57600	57600 bps		
115200	115200 bps		

AT Command: Xiamen Four-Faith Communication Technology Co.,Ltd. Page 54 of 96 Add: J1-J3,3rdFloor,No.44,GuanRiRoad,SoftWare Park,XiaMen .361008.China http://www.fourfaith.com Tel: +86 592-6300326 6300325 6300324 Fax: +86 592-5912735



AT+IPR=xxx xxx : one of the above baudrate

• Auto Back To Main Server

Auto Back To Main Server (1/0 - Yes/No)	0	•
0 No		
1Yes		

This item is only valid when you set "Data Center Number" as 1. In this mode, RTU will switch to backup center when main center have problems. If this item is set to 1, RTU will check whether the main center work fine timely. When it detects the main server work fine, it will return back to the main server at once.

AT Command: AT+RETMAIN=x x : 0 or 1



```
Device ID(8 Bytes
Hex-Decimal Characters):
```

The identity number of RTU, the value should be 8 bytes hex-decimal characters.

AT Command: AT+IDNT=aabbccdd aabbccdd: the identity number of RTU

SIM Card No



13912345678

The phone number of the SIM card .

AT Command: AT+PHON=xxxxxxxxx xxxxxxxxx: the SIM card phone number





The time interval used to determine whether the serial data frame transmission has completed, RTU will send the serial data to the center when two bytes transmit time interval larger than this item value.

AT Command: AT+BYTEINT=xxx xxx: bytes interval time value (millisecond)



Custom Register String:

This item is only valid when the WorkMode is TCST. It's the self defined register string. It can be empty, the maximum length is 70 bytes.

AT Command: AT+CONNRGST=xxx xxx: self defined register string

Custom Heartbeat String

Custom Heartbeat String:

This item is only valid when the WorkMode is TCST. It's the self defined heartbeat string, It can be empty, the maximum length is 70 bytes.

AT Command: AT+LINKRGST=xxx xxx: self defined heartbeat string

Page 56 of 96



Reconnect setting

Connect Retry Times:	65535
Reconnect Time Interval (Seconds):	0

In normal applications, RTU will always try to connect with the center even if the center has problems or closed. To reduce these unnecessary wireless data flow, you can configure the "Connect Retry Times" and "Reconnect Time Interval" items. When RTU fail to connect to the center with the configured Retry Time, It will sleep "Reconnect Time Interval" time, then start next retry.

"Connect Retry Times" AT Command: AT+RETRY=xxx xxx: times try to connect to the center

"Reconnect Time Interval" AT Command: AT+RDLWT=xxx xxx: the sleep time until next retry.

Transfer meanning

Transfer Meaning(0/1 - Yes/No): 0

0 --- Yes, enable transfer meaning

1 --- No, disable transfer meaning

This item is only valid when RTU and data center communication protocol is MODBUS. If this item is set to 0, RTU will transfer meaning to 0xfd and 0xfe. To know detail transfer meaning method, please refer <<RTU Transfer Meaning Explanation In the PROT work mode>>. If this item is set to 1, all the transmission is transparent.

AT Command: AT+STRAIGHT=x x: 0 or 1



4.1.4.8 Other Settings

Work State Switch	Serial Params	
Config Communication Reboot Enter Communication State	COM: COM1 V Baudrate: 115200	Parity: None V Close
Output Info	IP Modern Configuration	
Rtu add ain8 alarm text: add ain8 alarm 🔗	Data Service Center Settings IP Modern Settin	g Other Setting Scheduled Pc
Rtu counter enable: 0	NetWork	
Rtu counter alarm enable: U Rtu counter alarm text: counter alarm	APN:	cmnet
Rtu counter alarm NO: Rtu counter umor voluci - 4304087305	Username:	
Rtu counter value: 0	Password:	
Rtu counter way: 0 Rtu reprot time: 0	Call Center:	*99***1#
Rtu alarm upload type: 0	SMS Center	
Rtu alarm upload number: 0	Heartbeat Interval(31 ~ 65535):	60
ок	Trigger Method	
	Call Trigger Phone No:	
+IPR:115200	SMS Trigger Password(4 Bytes):	
ОК	Data Trigger On Password:	don
	Data Trigger Off Password:	doff
+MODE:TCPCON OK		
	TCP MTU(256-1450 Bytes):	1450
+ACTI:AUTO	Multi Center Reconnect Interval:	90
OK	SMS configure function:	Enable 🖌
	SMS configure password:	123456
Functions		
Show Config Show Bandrate Auto Detect Ver Info		
Signal Value Factory Setting Clear Output Save Output	Save Load From IP M	odem Power-Off
Browse. Save Config Load Config		

Network

APN:	cmnet
Username:	0
Password:	0
Call Center:	*99***1#

APN: access point name.

Username: username to login the ISP network.

Password: password to login the ISP network

Call Center: the call center phone number

Normally, the device Model and the parameters can configured as the following, if this can not work please inquiry your local mobile operators for the corresponding settings.

Model	APN	Username	and	Call center
-------	-----	----------	-----	-------------

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Page 58 of 96

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		password	
F2164	Cmnet	null	*99***1#
F2264	null	card	#777
F2364	cmnet	null	*99***1#
F2464	3gnet	null	*99#
F2564	cmnet	null	*98*1#
F2664	null	card	#777

AT Command of APN: AT+APN=xxxx xxxx: access point name

AT Command of Username: AT+USERNAME=xxx xxx: username

AT Command of Password: AT+PASSWORD=xxx xxx: password

AT Command of Call Center: AT+CENT=xxx xxx: call center phone number of ISP



SMS Center (+86)

+8613800592500

Your local SMS center number

AT Command: AT+SMSC=xxx xxx: your local SMS center number

Heartbeat Interval

Heartbeat Interval(31 ~ 65535): 60

Time interval sent heartbeat packet. (unit is second)

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Page 59 of 96

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AT Command: AT+POLLTIME=xxx xxx: heartbeat packet time interval

Call Trigger Phone No

Call Trigger Phone No:

This item is only valid when the "Trigger Type" is CTRL or MIXD. In this trigger type, RTU will keeps in idle state until it receives the trigger phone call, then it will connect to the center.

AT Command: AT+CTRLNO=xxx xxx : trigger phone number



SMS Trigger Password(4 Bytes):

This item is valid only when the "Trigger Type" is SMSD or MIXD, RTU will keeps in idle state until it receives the trigger short message, Then it will connect to the center.

AT Command: AT+SMSDPSWD=xxx xxx : SMS content to trigger RTU online

Data Trigger Password

Data Trigger On Password:	don
Data Trigger Off Password:	doff

This item is valid only when the "Trigger Type" is DATA or MIXD, RTU will keeps in idle state until it receives the trigger on data, then it will connect to the center, It will return to the idle state when receives trigger off data.

AT Command of Data Trigger On Password: AT+DONPSWD=xxx xxx : data trigger on password



AT Command of data trigger off password: AT+DOFFPSWD=xxx xxx :data trigger off password

♦ TCP MTU

TCP MTU(256-1450 Bytes):

The maximum transmission unit of TCP packet

1450

AT Command: AT+TCPMTU=xxx xxx : the MTU value

Multi Center Reconnect Interval

Multi Center Reconne	ect Interval:	90

This item is valid only when the "Data Center Number" is greater than 1.

When one of the configured data center lost connection, RTU will try to reconnect after the configured reconnect interval

AT Command: AT+MCONTIME=xxx xxx : reconnect time interval (unit is second)

• Set parameter of configure SMS

SMS configure function:	Enable 🗸	
SMS configure password:	123456	

When "SMS configure function" is enabled, RTU parameters are set by SMS. The format of SMS refer to <u>4.2 Setting by SMS</u>.

Command: AT+SMSCF=x Explanation: whether SMS configure function is enabled. Parameter: x range 0-1, 0 mean disable, 1 mean enable. Example: AT+SMSCF=1



Command:AT+SMSCPW=xxxExplanation:this password is used, when parameters are set by sms.Parameter:xxx mean password, it is not more than 7 bytes.Example:AT+SMSCPW=1234

4.1.4.9 Scheduled Power ON/OFF Setting

〒 IP Modem Configure Tool ¥1.3.2	
Work State Switch	Com: Com: Com: Com: Com: Com: Com: Com:
Output Info Rtu adc ain8 alarm text: adc ain8 alarm Rtu adc ain8 alarm NO:	P Modern Configuration P Modern Setting Other Setting Scheduled Power On/Off Setting Port Setti
Rtu counter enable: U Rtu counter alarm enable: 0 Rtu counter alarm text: counter alarm Rtu counter alarm NO:	Power On/Off Time Settings: Group 1: Disable
Rtu counter upper value: 4294967295 Rtu counter value: 0 Rtu counter way: 0 Rtu reprot time: 0	Group 2: Disable Set Set Set
Rtu alarm upload type: 0 Rtu alarm continue time: 0 Rtu alarm upload number: 0	Group 4: Disable Set
OK	Group 5: Disable Set
OK	Group 7: Disable Set
HMODE LOPCON OK	Group 8: Disable Set Group 9: Disable Set
+ACTI:AUTO OK	Group 10: Disable Set
- Functions	RTC timeset: System v 2012/11/02 14:25:58 Set:
Show Config Show Bandrate Auto Detect Ver Info Signal Value Factory Setting Clear Output Save Output	Save Load From IP Modem Power-Off
Browse Save Config Load Config	

◆ RTC(Real Time Clock) Time Setting

	RTC timeset:	System - 2011/01/24 16:28:02 System Manual	Set.
Click	"Set:"," to ensu	are the setting	
	AT Command AT+EXCCLI	d: K="yyyy/mm/dd,HH:MM:SS",W	

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For example:

If the current time is at 12:30 on September 1st,2010, Wednesday, the corresponding at command:

```
AT+EXCCLK="2010/09/01,12:30:00",3
```

Power On/Off Setting

Power On/O	ff Time Settings:	
Group 1:	Disable	Set:

Press "Set" you will see the follow window, you can do the setting.

Power On/Off	lime Settings:	
Switch operate:	Disable	
Switch mode:		
Current Settings:	Disable	
	OK	

AT Command:

AT+EXCALx=<options>[, <value1>[,<value2>[,<value3>]]]

Options:

- D -- Disabled. Scheduled Power On/Off function is disabled (Default).
- O On. Set the RTU power on time.
- S Shut Down. Set the RTU power off time.

Setting type, [IP] use for power on, C use for power off

- T -- Time. Set the action time point.
- H -- per Hour. Set a time point of every hour
- D -- per Day. Set a time point of every day
- W -- per Week. Set a time point of every week
- M -- per Month. Set a time point of every month
- I -- Interval. Set the time interval.
- P -- Power always on.
- C -- Count down. Set the count down length.

1. Disable

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Fc	our-Faith					User Manual
	Power On/Off	lime Settings [Group 1]:			
	Switch operate:	Disable	•			
	Switch mode:	<u></u>	~			
	Current Settings:	Disable				
		OK		CANCEL		

AT Command: AT+EXCALx=D

Note: There is no blank in this AT command, the same as followings.

2. On-time switch power on

Power On/Off 1	Time Settings [Group 1]:
Switch operate:	Power-On 💌
Switch mode:	One-Time Switch
Power-On time:	2010/08/01 + 12:30:00 +
Hold time:	3600 Sec
Current Settings:	Power-On time 2010/08/01 12:30:00 ,and Power-Off after 3600 Sec
	OK

AT Command

AT+EXCALx=OT,<strLongTime>,<holdTime> <strLongTime>: Format "2010/08/01,12:30:00" <holdTime>: Hold time value.(Unit:Second)

For example:

RTU power on at 12:30:00, and power off at 13:30:00 on August 1st,2010 AT+EXCAL5=OT,"2010/08/01,12:30:00",3600

3. Power on per hour



User Manual Power On/Off Time Settings [Group 1]: × Switch operate: Power-On -Switch mode: **v** 30 Per Hour Min 600 Hold time: Sec Current Settings: Power-On at 30 th Min per hour, and Power-Off after 600 Sec OK CANCEL

AT Command:

AT+EXCALx=OH,<strTime>,<holdTime> <strTime>: Format "00:30:00" <holdTime>: Hold time value.(Unit:Second)

For example:

RTU power on at the 30th minute in every hour, and power off 10 minutes later. AT+EXCAL1=OH,"00:30:00",600

4.Power	on	per	day
			···· J

Power On/Off 1	lime Settings [Group 1]:	\times
Switch operate:	Power-On	
Switch mode:	Dat Dati	
Switch mode.	Per Day	
Power-On time:	09:00:00	
Hold time:	3600 Sec	
Current Settings:	Power-On at 09:00:00 per day, and Power-Off after 3600 Sec	
	CANCEL	

AT Command:

AT+EXCALx=OD,<strTime>,<holdTime> <strTime>: Format "12:30:00" <holdTime>: Hold on value(Unit:Second)

For example:



RTU power-On at 09:00:00 everyday, and power-off 1 hour later. AT+EXCAL3=OD,"09:00:00",3600

5. Power on per week

Power On/Off	Time Settings [Group 1]:
Switch operate:	Power-On
Switch mode:	Per Week 💌
choose:	└ Mon └ Tues ♥ Wed └ Thur ♥ Fri └ Sat └ Sun
Power-On time:	09:00:00
Hold time:	3600 Sec
Current Settings:	Power-On on Wednesday、Friday、09:00:00 per week,and Power-Off after 3600 Sec
	CANCEL

AT Command:

AT+EXCALx=OW,<week>,<strTime>,<holdTime>

<week>: 0123456 replace to Sunday, Monday, Tuesday, Wednesday, Thursday, Friday and Sunday ordinal.

<strTime>: Format "12:30:00" <holdTime>: Hold time value(Unit:Second)

For example:

RTU power on at 09:00:00 on every Wednesday and Friday, and power off 1 hour later. AT+EXCAL1=OW,35,"09:00:00",3600 The "35" replace to Wednesday and Friday.

6.Power on per month



Power On/Off	Time Settings [Group 1]:
Switch operate:	Power-On 💌
Switch mode:	Per Month 28 th
Power-On time:	09:00:00
Hold time:	3600 Sec
Current Settings:	Power-On on 28 th 09:00:00 per month,Power-Off after 3600 Sec
	OK CANCEL

AT Command:

AT+EXCALx=OM,<date>,<strTime>,<holdTime> <date>: 0-31 <strTime>: Format "12:30:00" <holdTime>: Hold time value(Unit:Second)

For example:

RTU power on at 09:00:00 on the 28th every month, and power off 1 hour later. AT+EXCAL3=OM,28,"09:00:00",3600

7.Power on with time interval

Power On/Off	Time Settings [Group 1]:	×
Switch operate:	Power-On	
Switch mode:	Time Interval	
Time interval:	10 Min	
Hold time:	120 Sec	
Current Settings:	Power-On Per 10 Min, and Power-Off after 120 Sec	
	OK	

AT Command:

AT+EXCALx=OP,<intervalTime>,<holdTime>

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Page 67 of 96



<intervalTime>: interval time value(Unit:Minute) <holdTime>: Hold time value(Unit:Second)

For example:

RTU power on interval every 10 minutes, and power off 120 seconds later. AT+EXCAL1=OP,10,120

8.RTU online/offline with time interval

Power On/Off 1	Time Settings [Group 1]:
Switch operate:	Power-On 💌
Switch mode:	Timing On/Off-line
Time interval:	10 Min
Hold time:	120 Sec
Current Settings:	Online per 10 Min, and Offline after 120 Sec
	OK CANCEL

AT Command:

AT+EXCALx=OP,<intervalTime>,<holdTime> <intervalTime>: interval time value(Unit:Minute) <holdTime>: Hold time value(Unit:Second)

For example: RTU online interval every 10 minute, and offline 120 seconds later. AT+EXCAL1=OP,10,120

Note: RTU not power off in this mode, it is standby.

9. Power off at one time



Power On/Off T	ime Settings [Group 1]:
Switch operate:	Power-Off
Switch mode:	One-Time Switch
Power-Off time:	2011/01/25 . 11:48:23 .
Current Settings:	Power-Off time 2011/01/25 11:48:23
	OK CANCEL

AT Command:

AT+EXCALx=ST,<strTime>

10.Power off per hour

Power On/Off 1	Time Settings [Group 1]:	×
Switch operate:	Power-Off	
Switch mode:	Per Hour v 20 Min	
0	Device Off et 00 th USe and have	
Current Settings:	Power-Off at 20 th Min per nour	
	OK	

AT Command: AT+EXCALx=SH,<strTime>

11.Power off per day



Ir-Faith User Manual		
Power On/Off 1	Time Settings [Group 1]:	
Switch operate:	Power-Off	
Switch mode:	Per Day 💌	
Power-Off time:	11:51:28	
Current Settings:	Power-Off at 11:51:28 per day	
	OK CANCEL	

AT Command:

AT+EXCALx=SD,<strTime>

12.Power off at the same time in every week

Power On/Off Time Settings [Group 1]:	×
Switch operate: Power-Off	
Switch mode: Per Week	
choose: 🦳 Mon 🔽 Tues 🗌 Wed 💌 Thur 🗐 Fri 📄 Sat 🗐 Sun	
Power-Off time: 11:51:28	
Current Settings: Power-Off on Tuesday, Thursday, 11:51:28 per week	
OK	

AT Command:

AT+EXCALx=SW,<week>,<strTime>

13.Power off per month



Power On/Off	Time Settings [Group 1]:	
Switch operate:	Power-Off	
Switch mode:	Per Month 🗾 15 th	
Power-Off time	11:51:28	
Current Settings:	Power-Off on 15 th 11:51:28 per month	
	OK	

AT Command:

AT+EXCALx=SM,<date>,<strTime>

14.Power off with countdown

Power On/Off	lime Settings [Group 1]:
Switch operate:	Power-Off
Switch mode:	Countdown Power- 🗸 600 Sec
Current Settings:	Power-Off after 600 Sec
	CANCEL

AT Command:

AT+EXCALx=SC,<afterTime> <afterTime>: Countdown value(Unit:Second)

For example: RTU power off 600 seconds later: AT+EXCAL1=SC,60

Note: If the <aftertime> is 0,the RTU will power off immediately.



4.1.4.10 SMS Setting

Nork State Switch	Serial Params
Config Communication Reboot Enter Communication Sta	ate COM: COM1 V Baudrate: 115200 V Parity: None V Close
Dutput Info	/IP Modem Configuration
Rtu adc ain8 alarm text: adc ain8 alarm Rtu adc ain8 alarm NO: Rtu counter enable: 0	Cther Setting Scheduled Power On/Off Setting Port Setting SMS Setting
Rtu counter alarm enable: 0 Rtu counter alarm text: counter alarm Rtu counter alarm NO:	SMS Sending Number Setting(5 Number per group,divided by',) SMS Sending 13912345678
Rtu counter upper value: 4294967295 Rtu counter value: 0 Rtu counter way: 0	SMS Sending 13912345678
Rtu reprotitine: 0 Rtu alarm upload type: 0 Rtu alarm continue time: 0 Rtu alarm upload number: 0	SMS Sending 13912345678
ок	SMS Sending 13912345678
+IPR:115200 OK	
+MODE:TCPCON	SMS Sending Format Common SMS
ок	Data upload Style: Network Only
+ACTI:AUTO OK	
Functions	
Show Config Show Bandrate Auto Detect Ver Inf	
Signal Value Factory Setting Clear Output Save Out	Load From IP Modern Power-Off
Browse Save Config Load Cor	nfig

Destination number

SMS Sending Number Setting(5 Number per group, divided by',')		
SMS Sending	13912345678	
SMS Sending	13912345678	
SMS Sending	13912345678	
SMS Sending	13912345678	

When RTU "Data upload Style" selects "SMS Only" or "Main Network SMS backup", The RTU will send report information by SMS. This parameter used for setting SMS destination number. Five phone numbers can be configured at each group, Each phone numbers are separated by


comma. The length of each phone number should less than 15 bytes.

AT Command: AT+PHONEn=xxx n range 1-4 correspond to group 1-4. xxx means destination phone number.

SMS Sending Format

SMS Sending Format	Common SMS	*

Common SMS: It means visible characters. ASCCI code value is less than 127. HEX SMS: It can send any hexadecimal number of 0x00-0xff.

AT Command: AT+HEXSMS=x x range 0-1 0 means common SMS, 1 means HEX SMS.

• Data upload Style

	Matural: Only	
Data upload Style:	Network Unly	*

Extend RTU: acquisition data and alarm information are uploaded with extended RTU protocol.

There are three methods, as below:

Network Only: In this style, all application data are uploaded by network only. If RTU connect network fail, acquisition data will be saved to SPI FLASH. This acquisition data will uploaded when RTU successfully connected to network.

SMS Only: In this style, all application data are uploaded by sms only.

Main network SMS backup: In this style, all application data are uploaded with network as the first choice, if the network broken or connect fail, the application data will be uploaded by SMS.

AT Command: AT+OPENSMSBCKP=x x range 0-2 0 means Network Only, 1 means SMS Only, 2 means Main network SMS backup



4.1.4.11 Functions

Functions			
Show Config	Show Bandrate	Auto Detect	Ver Info
Signal Value	Factory Setting	Clear Output	Save Output
	Browse	Save Config	Load Config

Show Configure

Show Config(F)

Show current RTU settings



Show Baudrate

Display the communication baudrate

• Auto Detect

Auto Detect(A)

Simple way to determine whether RTU work fine

Version Display

Ver Info(V)

Show the software and hardware version

Signal Value

Signal Value(I)



Display current wireless signal value

Factory setting

Factory Setting

Restore to factory settings

Clear Output

Clear Output (C)

Clear the output information



Save Output

Save the output info to a file

• Browse

Browse..

Browse the file directory

• Save Configure

Save Config

Save the current settings to a file, you can restore it from this file later

♦ Load Configure

Load Config

Load parameters from a file.



4.1.5 Work State Switch

-Work State Switch-

🖲 Config 🔿 Communication Reboot Device, Enter Communication State

This tool can work in two states, "Configure" and "Communication"

Configure:

This state is used to configure parameters of RTU.

Communication:

This state is used as a common serial communication tool

Reboot Device, Enter Communication State:

This function button is used to reboot RTU and make the software switch to Communication state

4.2 Setting by SMS

4.2.1 Setting by AT command of SMS

When parameters configuration using this way, the length of SMS should not more than 140 bytes, It means that does not support long SMS.

Note: When parameters configuration using this way, the contents of setting must not include a semicolon.

The following format:

<password:command1;command2...>

password: This is a valid setting command, when this password is the same as the password at 4.1.4.8 Set parameter of configure SMS.

command: one sms can include multiple commands. At 4.1.4 configuration, AT command remove AT+ remaining command. This command is AT command of SMS. Multiple commands are separated by a semicolon.

...: This symbol indicates that one sms can include multiple commands.

For example: <123456;IPAD=120.42.46.98;PORT=5007> Explanation: password is 123456, main center IP is 120.42.46.98, main center port is 5007.

SMS setting response as following:

setting successful: RTU will send one response SMS to user. SMS content: command(Corresponding setting command): Configure successful.

setting failed: RTU will send one response SMS to user, SMS content: Xiamen Four-Faith Communication Technology Co.,Ltd. Page 76 of 96

Add: J1-J3,3rdFloor,No.44,GuanRiRoad,SoftWare Park,XiaMen .361008.China



command(Corresponding settting command): Configure failed.

4.2.2 setting remote upgrade

When RTU needs remote upgrade firmware, You need to know software version and server address.

Command: RMTUPGRADE=aa,b,cc,ip,port,ver Explanation: upgrade firmware command. Parameter: aa: firmware style, 00 means application firmware, 01 means BOOT firmware. b: connect style, 0 means TCP, 1 means UDP. cc: number of transmitting windows, rang 01-16. recommended value 16 for TCP, value 4 for UDP. ip: upgrade server IP address, this server has upgrade firmware ,the RTU will retrive firmware from this server. port: upgrade server listening port number. ver: the software version of the upgrade firmware Example: <123456; RMTUPGRADE=00,0,16,120.42.46.98,9991, F2X64-STANDARD-V1-0-1> Command: STPUPGRADE: Explanation: stop upgrade firmware. Parameter: none. Example: <123456;STPUPGRADE>

4.3 Setting for RTU extended protocol

RTU extended protocol configuration, please refer to appendix 5.2.10 Remote configure.



Chapter 5 Software Manual

5.1 TCP2COM manual

TCP2COM software can used to transfer data which receive from RTU to a specified virtual serial port, and it can also transfer data which send by virtual port to RTU.

5.1.1 Open software

Four-Faith TCF	2COM V2.4	A						x
Operation Setti	ng View Window Datab	ase Help(H)						
\mathbf{O}) 🗢 🌉			Q				
Device ID	Phone No	Source IP	Serial Por	Baudrate	Device Status	Serial Status	Inbound flow(byte)	Ou
								_
Total Tunnels:0	Total Online:0				Running: 0 Day	0 Hour 4 Minute	13 Second	

If it shows as below, please check current software path exist Info.mdb, if exists that means there is something wrong with Info.mdb, Please open Info.mdb by using Access ,and choose menu "Tools"->" Database practical tools"->" Compression and repair the database" of the Access to repair it.



5.1.2 Install the driver

Before using virtual serial port, you must install the driver of virtual serial port with the followingXiamen Four-Faith Communication Technology Co.,Ltd.Page 78 of 96Add:J1-J3,3'dFloor,No.44,GuanRiRoad,SoftWare Park,XiaMen .361008.ChinaPage 78 of 96http://www.fourfaith.comTel:+86 592-630032663003256300324Fax: +86 592-5912735



steps :

Click Menu "Operation", choose the item "Add virtual port", it will pop up the dialog which you can set the virtual serial port number, then click OK to install the driver.

Then the PC will install device driver, and show whether the driver has been installed successfully as following.

Install Driv	er		×	1
Sele	ct Virtual Serial Port NO: CO	OM 15		
	ОК	CANCEL		
Setup f	for com0com (INSTALL)			
	CNCA12 PortName=COM15 CNCB12 PortName=COM15_F	ΥF		
	nstalling device driver sof lick here for status.	ftware 🔌 X		

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5.1.3 Add virtual serial port



Click button

or click "window"-----"Tunnel Manager"as below:

Device ID	Serial Port No	Baudrate	Databit	Parity	Stopbit	Remark

Click "Add Tunnel", Set the params according to the serial port property.



User Manual 23 Add Tunnel Device ID 74736525 Serial Port COM1 • 115200 8 Databit Baudrate None 1 Parity Stopbit ×. Note

Close

Note: Set the transfer tunnel parameters in this interface, the setting as above set the Device ID of RTU as 74736525, and set the data transfer to COM1, and the data from COM1 will also be transfered to RTU which ID is 74736525.

When finishing setting transfer parameters, click "Save", it will show whether the add tunnel operation is success.



Save

If add tunnel success, it will show transfer parameters on Tunnel Manger interface as following:



52

Device ID	Serial Port No	Baudrate	Databit	Parity	Stopbit	Remark
74736525	COM1	115200	8	None	1	

Note:

A, Different ID of RTU can transfer to one same serial port, but it can not transfer one ID of RTU to multiple serial ports.

B、Tunnel Manger can also Modify and Delete the exist tunnel.Current version support 5000 tunnels at most.

5.1.4 Setting the server parameters

Click Menu "Setting" item or click butto	to open setting dialog:
Setting	
Server Listen Port	5001 -
Online Detect time interval(sec)	32 🗸
ОК	CANCEL

The setting as above set the server listening port as 5001, and set online detect time interval as 32 sec(current system time minus lastest time to receive data ,if the value big than 32,the software will show this RTU has disconnected)

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Page 82 of 96



"Tunnel Manager" and "Setting" parameters are saved to database, so the next time to open the software , you don't need to reset the parameters.

5.1.5 Server connection state

After setting the parameters of tunnel and server, click menu "Operation"->"Start service" or just



press button , the software will start to listening and waiting the connection from RTU.

Here is the state of id of 74736574 RTU not connected

Four-Faith	TCP2COM V2.4				100		and a second	
Operation S	etting View Window Data	oase Help(H)						
	2 🗢 🌉	🗐 🛃 🄇		Q				
Device ID	Phone No	Source IP	Serial Por	Baudrate	Device Status	Serial Status	Inbound flow(byte)	Outbound flow(I
74736525			COM1	115200	Off	Connected	0	0
Total Tunnels:	1 Total Online:0				Ru	inning: 0 Day 0 H	lour 17 Minute 38 Secon	d I

After starting service it will show the detail information of all tunnels .

Here is the state of ID 74736525 RTU connected

Four-Faith TC	CP2COM V2.4							- O X
Operation Set	tting View Window Databa	ase Help(H)						
) 🗢 🗾 🖣		1	Q				
Device ID	Phone No	Source IP	Serial P	Baudrate	Device Status	Serial Status	Inbound flow(byte)	Outbound flo
74736525	13912345678	127.0.0.1	COM1	115200	Connected	Connected	7	0
1								
Total Tunnels:1	Total Online:1				Run	ning:0 Day 0 H	lour 0 Minute 56 Seco	nd

When connection establish success ,the list will show the Phone Number, Source IP, Inbound flow

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and Outbound flow as above. Click **V** to stop service.

5.1.6 Monitor

Click Menu "Window"->"Monitor Window",or press button

, it will show the monitor

window which can show outbound and inbound data as following.if you want to monitor one tunnel just click the left tree id,it will show the selected id data.

Start Stop Clear	Close 🔲 HEX Display 🕼 Display All Tunnel Info
74736525–COM1	2011-05-06 11:38:26—>Receive data from 74736525, Transmit to COM1 success, data: 12345
	2011-05-06 11:38:21—>Receive data from 74736525,Transmit to COM1 success,data: 12345
	2011-05-06 11:38:16—>Receive data from 74736525,Transmit to COM1 success,data: 12345
	2011-05-06 11:37:46—>Start Watching

5.1.7 Not transmited data query



, you can query

Click menu "Database"->"Query Not Transmited Data", or press button

the data which receive from RTU but transfer to serial port failed as following $\ ,$

Also you can just open the database file "Info.mdb" (Access Database file), find table "NotTransData" to query the data.

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User Manual



ery Not T <mark>ran</mark> smit Data	ALC: ALC: NO.	
Input the device ID for query: 74736574	Query Data	Close
🔲 HEX Display	Clear	Save To File
Receive Time:2011-03-31 14:55:24, Receive Data: 123456789sfsdf		[
Receive Time:2011-03-31 14:55:37, Receive Data: 123456789sfsdf		
Receive Time:2011-03-31 14:55:45, Receive Data: 123456789sfsdf		
Receive Time:2011-03-31 14:55:54, Receive Data: 123456789sfsdf		
Receive Time:2011-03-31 14:55:55, Receive Data: 123456789sfsdfss		
Receive Time:2011-03-31 14:56:00, Receive Data: 123456789sfsdfss		
Receive Time:2011-03-31 15:00:16, Receive Data: 123456789sfsdfss		
Receive Time:2011-03-31 15:00:28, Receive Data: 123456789stsdfss		
Receive Time:2011-03-31 15:00:35, Receive Data:		
Receive Time:2011-03-31 15:00:54, Receive Data:		
Receive Time:2011-03-31 15:16:52, Receive Data:		
ss123456789stsdtss Receive Time:2011-03-31 16:23:44, Receive Data:		

5.1.8 Delete database data

Click menu "Database"->"Delete saved data", or press button wow, you can delete the data by device ID, also you can delete all of the data in database, the dialog as below

elete Database Data		— ×
Delete by device ID:	74736574	Delete this ID data
Delete all the	data	Close

Xiamen Four-Faith Communication Technology Co., Ltd.

Page 85 of 96



5.1.9 Quit

Click menu "Operation"->"Exit",or press button



Press OK to quit TCP2COM.

5.2 RTU center service

5.2.1 Open software

Xiamen Four-Faith RTU	J Server ¥1.	1 About				
operation Setting Configure	query Asset	Sperace About				
		🗡 🏹 ź				
_	Device ID	Login Time	Refresh Time	SIM Card Number	Online State	
Ť	RTU Return D	ata Send Trans Dat	a Optocoupler and Rel	ay Control RTU Alarm	Info Center Service :	Info 🔹
	Device ID	Digital Channel 1	Acquisition Time	Digital Channel 2	Acquisition Time	Digita
	<					>

Ø

,it will show as below

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5.2.2 Service setting

Please open the picture as follow:



"Listening Port" is the listening port this software bind.

"Offline Time" is interval that center software scan equipment time. "Service Style" is the style of the network. Configuration parameters accord to the actual situation . Please click "OK" after configuration

5.2.3 Start equipment and connect



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The ID number and SIM number is used to distinguish between different devices. When configure parameters, please be sure to modify these two parametes(These two parameters of the different devices should be different). Specific parameter modification please refer to appendix 4.1.4.7 <u>Device ID and SIM Card No</u>.

5.2.4 View the acquisition data

(10) Xiamen Four-Faith RTU	J Server ¥1.	1				
Operation Setting Configure	Query Reset	Upgrade About				
	;;;	💥 🔍 🔬	2 🕐 🧿			
Start Service Success 🖂	Device ID	Login Time	Refresh Time	SIM Card Number	Online State	
	74736574	2012-09-13 09:52:20	2012-09-13 09:53:05	13912345678	Online	
	RTU Return I	Data Send Trans Data	Optocoupler and Rela	y Control RTU Alarm	Info Center Service	Info 🔨 🔪
	Device ID	Digital Channel 1	Acquisition Time	Digital Channel 2	Acquisition Time	Digita
	74736574	Low level	2012-09-13 09:52:49			
	<					>

Can view infomationg that includes device ID, acquisition channels, acquisition data and acquisition time as above picture.Should turn on reported switch, please refer to appendix 4.1.4.4 active report function and active report interval and each channel need to enable acquisition function and active report function.

5.2.5 Send data to RS232/RS485

RTU Return Data Send Trans Data	Optocoupler and Relay Control RTU Alarm Info Center 3	Service Info 🔹 🔪
Choose Device ID: 74736574	HEX Send Send	
hellow world!		~

First select a different device ID, second input content in the edit window, then click "Send" button.

Then, RTU RS232/RS485 will send out this content.



5.2.6 Control optocoupler and relay

IU Return Data Send Trans Data Optocoupler and Relay Control RTU Alarm Info Center Service Info						
Optocoupler 1 Style:	✓ Optocoupler1 Square-wave cycle(20ms):					
Optocoupler 2 Style:	• Optocoupler2 Square-wave cycle(20ms):					
Optocoupler 3 Style:	Optocoupler3 Square-wave cycle(20ms):					
Optocoupler 4 Style:	Optocoupler4 Square-wave cycle(20ms):					
Relay 1 Style:	×					
Relay 2 Style:	v					
Relay 3 Style:	✓					
Relay 4 Style:	▼					

According to the different device ID control different optocoupler and relay. Just click "Send Control" button o complete control. Please set parametes thart refer to 4.1.4.2 <u>Digital output</u> <u>function</u>.

5.2.7 Alarm information

RTU Return	Data Send Tr	ans Data Optocouple	r and Relay Control	RTU Alarm Info Cente	r Service Info 🔹 🕨
Devi 🛆	Alarm Type	Channel Address	Acquisition Value	Acquisition Time	<u>^</u>
74736574	Digital	Channel 1	0	2012-09-13 09:51:49	
74736574	Digital	Channel 1	0	2012-09-13 09:53:49	
74736574	Digital	Channel 1	0	2012-09-13 09:55:49	
74736574	Digital	Channel 1	0	2012-09-13 09:57:49	
74736574	Digital	Channel 1	0	2012-09-13 09:59:49	
74736574	Digital	Channel 1	0	2012-09-13 10:01:49	
74736574	Digital	Channel 1	0	2012-09-13 10:03:49	
74736574	Digital	Channel 1	0	2012-09-13 10:05:49	
74736574	Digital	Channel 1	0	2012-09-13 10:07:49	
74736574	Digital	Channel 1	0	2012-09-13 10:09:49	
74736574	Digital	Channel 1	0	2012-09-13 10:11:49	
74736574	Digital	Channel 1	0	2012-09-13 10:13:49	~

Can view different device and diffent alarm information that includes alarm type, channel address, acquisition value and acquisition time.

5.2.8 Center service information

Send Trans Data Optocoup	oler and Relay Con	ntrol RTU Alarm	Info Center	Service Inform	ation 🔹
Service Statistics					
Current Service Style:	TCP	Listening	9991 Port:		
Total Device Number in List:	1	Total C	Online: 1		
Total RTU Return Records:	55 1	otal RTU Alarm Info Re	cords: 28		

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Can view the basic information of the center software.

5.2.9 Query data

Select the device (click the check box in front of the device ID), Please click operate as following picture.

icon or

 • Xiamen Four-Faith RIU Server VI.1

 Operation Setting Configure
 Query Reset Upgrade About

 • Operation Setting Configure
 Query Data

 • Operation Setting Configure

 • Operation Setting Configure

Please click it, then appear as follow picture.

Query							
Digital Channel Query Channel 1 Channel 2 Channel 3 Channel 4 Channel 5 Channel 6 Channel 7 Channel 8 Analog Channel Query Channel 1 Channel 2 Channel 3 Channel 4 Channel 5 Channel 6 Channel 7 Channel 8							
Device ID • 74736574	Device ID Digital Channel 1 Acquisition Time Digital Channel 2 Acquisition Time Digital · 74736574 Low level 2012-09-13 10:57:02 - <t< td=""></t<>						
Query Log Query acquisition information return successful Current ID: 74736574 Counter Value: Query Counter Query Acquisition Info Query Log Quit Query							

Please select the channel, then click "query Acquisition info" button. It also can query counter value, when click "Query Counter" button.

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5.2.10 Remote configure

Select the device (click the check box in front of the device ID), Please click operate as following picture.

icon or

🕲 Xiamen Four-Faith RTU Server V1.1							
Operation Setting Configure Query Reset	Upgrade About						
Remote Configure 🙀 🔍 🛧 🕐 🥥							
Start Service Success 🔨 🛛 Device ID	Login Time	Refresh Time	SIM Card Number	Online State			
☑ 74736574	2012-09-13 09:52:20	2012-09-13 11:03:07	13912345678	Online			

Please click it, then appear as following picture.

Configuration Itom	Configuration Value	Sand AT Compand		
Digital channel 1 Settings	Connyuration value	Send AI Command		
Digital input function:				
MODBUS logic corresponding				
Acquisition purpose:				
Acquisition interval(10mS):				
Alarm trigger condition:				
Alarm content(less than 140 b			🗌 Send New Line	Send
Alarm Phone Number(less tha		Configure Log		
Digital channel 2 Settings				
Digital input function:				
MODBUS logic corresponding				
Acquisition purpose:				
Acquisition interval(10mS):				
Alarm trigger condition:				
Alarm content(less than 140 b				
Alarm Phone Number(less tha				
Digital channel 3 Settings				
Digital input function:				
MODBUS logic corresponding				
Acquisition purpose:				
Acquisition interval(10mS):				
Alarm trigger condition:				
Alarm content(less than 140 b				
Alarm Phone Number(less tha		<		>

Specific configuration parameters please refer to appendix 4.1.4 Configuration.

5.2.11 Upgrade

When need to upgrade, please contact the us to get the server address and software version.

icon or

Select the device (click the check box in front of the device ID), Please click operate as following picture.

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Four-Faith					Use	r Manual	
() Xiamen Four-Faith RIU	Server ¥1.						
Operation Setting Configure Q	luery Reset U	pgrade About					
🖸 🖉 🎯 🐺 📧 🐺 🍳 🚣 🕐 🧕							
Start Service Success 🔥 🗌	Device ID	Login Time	Refresh Time	SIM Card Number	Online State		
	74736574	2012-09-13 09:52:20	2012-09-13 11:08:05	13912345678	Online		

Please click it, then appear as follow picture.

Upgrade			×
Current ID: 74736574			
Upgrade Settings			
Upgrade Server IP:		Upgrade Server Port:	~
Protocol Mode:	~	Version Name:	
	Setup And Upgrade	Quit Upgrade	
Query Version			
APP Version:		Query Version	
Log Info			
1			

Upgrade Server IP: it means the upgrade firmware in this sever(IP address).

Upgrade Server Port: it means the upgrade server listening port (port number).

Protocol Mode: the upgrade process using TCP or UDP. If select TCP, <u>5.2.2 service setting</u> need to select TCP. If select UDP, <u>5.2.2 service setting</u> need to select UDP.

Version Name: the software name that need to upgrade.

App Version: query current software name.

Please click "Setup And Upgrade" button after complete configuration.

5.2.12 Reset device



Select the device (click the check box in front of the device ID), Please click operate as following picture.



If click this button, RTU will reboot.

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Page 93 of 96



Appendix

The following steps describe how to make RTU enter configure state with the Windows XP Hyper Terminal.

1. Press "Start"→ "Programs" → "Accessories" → "Communications" → "Hyper Terminal"

Connection Description	? 🗙
New Connection	
Enter a name and choose an icon for the connection:	
Name:	
ff	
lcon:	
	×
OK Ca	ncel

- 2. Input connection name, choose "OK"
- 3. Choose the correct COM port which connect to RTU, choose "OK"

Connect To	? 🔀			
e 16				
Enter details for the phone number that you want to dial:				
Country/region:	United States (1)			
Area code:	123			
Phone number:				
Connect using:	СОМ1 💌			
	OK Cancel			

4. Configure the serial port parameters as following, choose "OK"

Bits per second: 115200

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Data bits: 8 Parity: None Stop bits: 1 Flow control: None

COM1 Properties		? 🗙
Port Settings		
Bits per second:	115200	
Data bits:	8	
Parity:	None	
Stop bits:	1	
Flow control:	None	
	Restore Defa	aults
	K Cancel	Apply

5. Complete Hyper Terminal operation, It runs as following

🌯 ff - HyperTerminal		×
File Edit View Call Transfer Help		
		A
Connected 0:00:06 Auto detect Aut	Auto detect SCROLL CAPS NUM Capture Print echo	

6. Re-power RTU, put mouse focus on the Hyper Terminal and press "s" key continuously until RTU enter configure state as following





7. RTU has entered configure state, you can configure the parameters through AT command.