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# Chonghan CH-D1 Wireless DTU User manual

Chonghan Wireless DTU Series User  
manual

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**崇瀚科技 Chonghan**

Power by Chonghan

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*Note: Some airlines may permit the use of cellular phones while the aircraft is on the ground and the door is open. Chonghan Wireless device may be used at this time.*

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# 1. Overview

DTU (IP Modem or M2M) used for serial port device data transparent transmit. The document describes how to use the Chonghan CH-D1 series wireless DTU and FAQ. The aim to help user easy and quick to test, use and disposition the DTU.

*Note: Though all features are documented in this manual, new features may still be in beta stage at publication and therefore may not yet be validated. Please refer to the Customer Release Note for complete and detailed information regarding beta and validated features at time of release.*

## 1.1. Document History

Version	Date	Comments	Author
1.00	2010-09-10	Initial Release Version.	Samuel
2.00	2015-09-17	New file structure.	Cai Jinyong
2.01	2015-10-19	Modify contact	Cai Jinyong
2.02	2016-05-18	Change address	Cai Jinyong
2.03	2017-06-22	Refresh the pictures	Lei Dong
2.05	2019-04-19	Add step by step status check	Samuel

## 1.2. References

[CHONGHAN CHD1G2S2 GPRS DTU DATASHEET ENG](#)

[CHONGHAN CHD1G2C1 GPRS DTU DATASHEET ENG](#)

[CHONGHAN CHD1C1Z12 CDMA DTU DATASHEET ENG](#)

[CHONGHAN CHD1C1H11 CDMA DTU DATASHEET ENG](#)

## 1.3. Abbreviations

Abbr.	Full name
APN	Access Point Name
DAC	Digital Analog Converter
GGSN	Gateway GPRS Support Node
GPRS	General Packet Radio Service
IP	Internet Protocol
KB	Kilobyte
MCC	Mobile Country Code
MNC	Mobile Network Codes
MS	Mobile Station
PDU	Protocol Data Unit
PLMN	Public Land Mobile Network
RSSI	Received Signal Strength Indication
SMA	Small Adapter
SMS	Short Message Services

## 1.4. Products List

Product	Description		
CH-D1G2S2-100	GPRS	EGSM 900MHz, DCS 1800MHz	RS-232(DB9)
CH-D1G2S2-200			RS-485(DB9)
CH-D1G2C1-100		GSM850,EGSM900,DCS1800,PCS1900	RS-232(DB9)
CH-D1G2C1-200			RS-485(DB9)
CH-D1C1H11-100	CDMA	800MHz	RS-232(DB9)
CH-D1C1H11-200			RS-232(DB9)
CH-D1C1Z12-100			RS-232(DB9)
CH-D1C1Z12-200			RS-485(DB9)

## 1.5. Presentation Rules

The AT+I commands ignore case. For recognizable, the lowercase for input and uppercase for respond. For example:

```
at+i<cr> // input command
I/OK // device response
```

## 1.6. Character Type

The send mode support all character send and receive, other mode only below valide:

Type	Value	Describe
Printable	0x20 ~ 0xFE	<0X20> ... <0XFE>
Carriage Return	0x0D	<CR>
Line Feed	0x0A	<LF>
Submit	0x1A	<CTRL+Z>
Escape	0x1B	<ESC>

## 1.7. AT+I Command Syntax

```
at+ixxxx=?<cr> // returns the list of
                  parameters and value ranges
at+ixxxx=<...><cr> // sets user-definable parameter
                  values
at+ixxxx?<cr> // returns the currently set
               value
at+ixxxx<cr> // execution command
```

*Note: the AT+I command not case-sensitive, prefix by at+i and terminate by <cr>.*

## 2. Introduction

With the development of wireless communication technologies, wireless products are being adopted in numerous industrial and civilian fields. Shenzhen Chonghan Co., Ltd. a leader of wireless communication equipment manufacturer releases the CH-D1 Series Wireless DTU, which support

various frequency bands of GPRS/CDMA2000 1X, and provide industrial terminal solutions for 2.5G communication. As a wireless DTU, it support AT+I command set via RS-232/RS-485/TTL interface.

CH-D1 series wireless DTU adopts industrial level modules, specially designed for the complicated industrial environment which compatible with EMC, and will be your best choose of wireless communication.

## 2.1. Features

- Data transparent transmit
- Always online
- Trigger up online
- Remote reboot
- AT+I command interface
- Support GPRS / CDMA2000 1X
- Support APN or VPDN
- LED: power, ring, data
- Interface level: RS232 / RS485 / TTL
- Watchdog(software and hardware)
- Industrial design for small dimension
- Robust industrial housing, Steel shell for anti-electromagnetic interference
- DC5~25V wild rang, lower-power

## 2.2. Application

- Remote Data Monitor and Control
- Water, gas and oil flow metering
- AMR (automatic meter reading)
- Power station monitoring and control
- Remote POS (point of sale) terminals
- Traffic signals monitor and control
- Fleet management
- Power distribution network supervision
- Central heating system supervision
- Weather station data transmission
- Hydrologic data acquisition
- Vending machine
- Traffic info guidance
- Parking meter
- Telecom base station supervision (Mobile base station, microwave or optical relay station)
- Oil field data acquisition
- Warehouse supervision

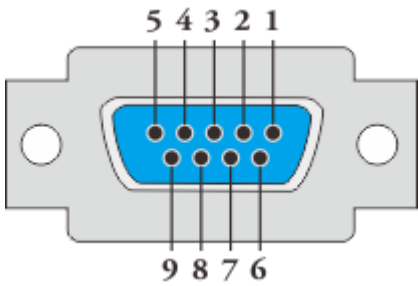
## 3. Basics

### 3.1. Hardware Connection

Description		Image
LED Power	ON	Boot



	FLASH	running	
LED Ring	ON	Boot	
	FLASH	incoming call	
LED Data	ON	Boot	
	FLASH	data transfer	
Antenna	50Ω/SMA/Female		
SIM	3.3V/1.8V		
Power	Φ 5.5mm/2.5mm 5~25V ( suggest 12V )		
Serial Port	DB9		

Data Interface	PIN	RS-232	RS-485
	1	DCD (Power for Option)	NC (Power for Option)
	2	TXD	B
	3	RXD	A
	4	DTR	NC
	5	GND	GND
	6	DSR	NC
	7	CTS	NC
	8	RTS	NC
	9	RI	NC

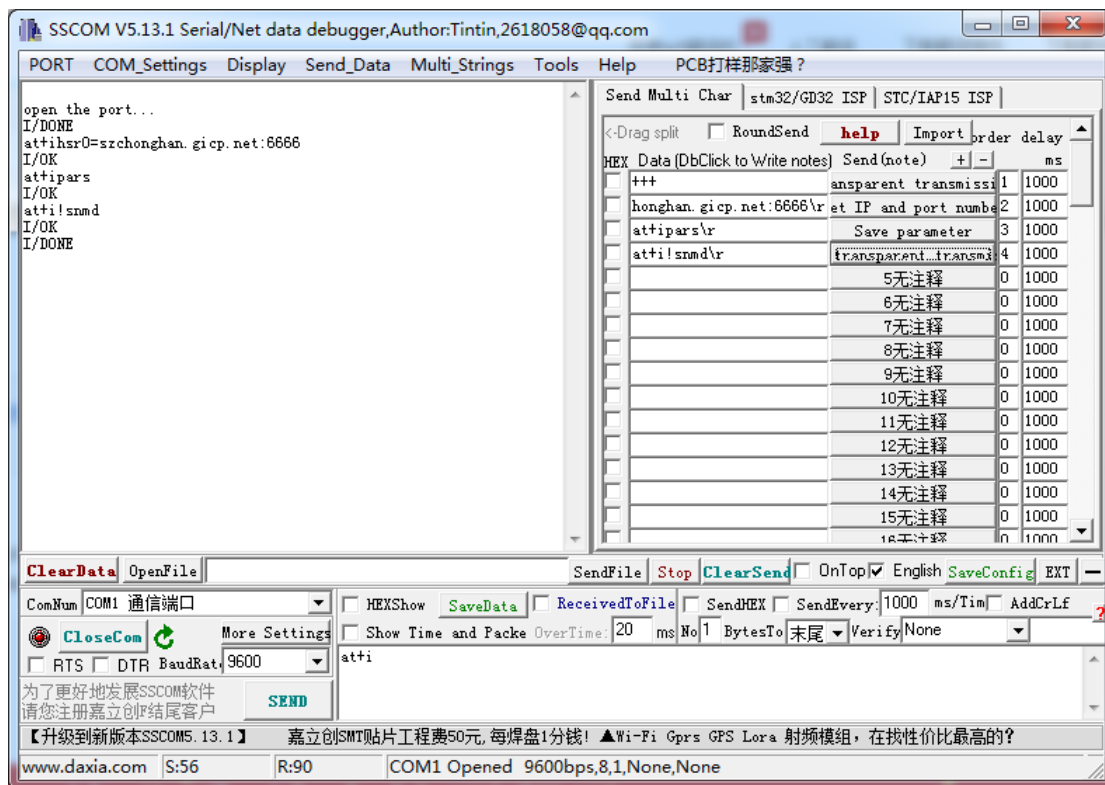
Assemble the antenna, power adapter, connect the DTU to PC via RS-232 serial cable, open the back cover, insert SIM/UIM card, at last, power on.

*Note: Don't insert or remove the SIM/UIM card in the power on status.*

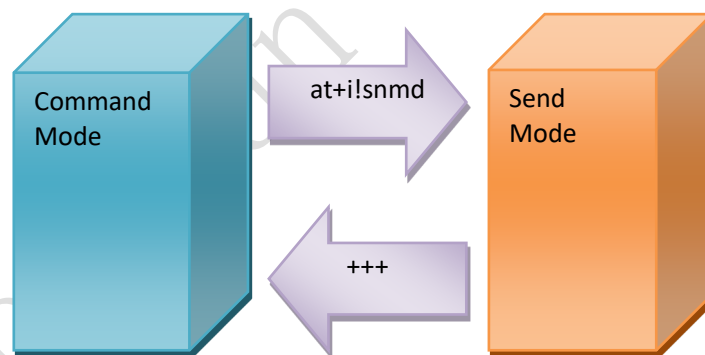
## 3.2. Software Tools

Any serial port tools is compatible to DTU config, the follow is sample by SSCOM.

**Open SSCOM.** Click the send instruction in turn. **Note: there is a return value and then the next instruction operation.**



### 3.3. Mode Switch Command



```
+++ // return to command mode, the
// "+" do not display, wait 10
// seconds for respond
I/ERROR(056) // the background operate is
// abort, and start to accept
// the commands

at+!snmd<cr> // switch to transparent data
// transmit mode

I/OK
```

## 4. Configure DTU

### 4.1. TCP Transmit

#### 4.1.1. TCP Client Always Online

```
at+ihsr0=ip:port<cr> // set the host serve IP and port
at+ipars<cr> // parameter save
at+i!snmd<cr> // switch to Serial Net mode
```

#### 4.1.2. TCP Client Trigger online

```
at+ihsr0=ip:port<cr> // set the Server IP and port
at+iiato=n<cr> // n=Integer, the DTU will offline when the connect no data transport in (n) seconds
at+itup=1<cr> // set it to trigger up mode,
at+ipars<cr> // parameters save
at+isnmd<cr> // switch to Serial Net mode
```

#### 4.1.3. TCP Client Step by Step

```
at+istcp:ip,port<cr> // establish a TCP connection to the IP and port
I/(000) // 000 is the Right connection handle
I/ERROR(075) // not register cellular network, please check Card and Signal quality
I/ERROR(207) // register cellular network, But can 't connecting to TCP server program, you should to check firewall, IP Port and port listen if collide with them
at+issnd%:000,n:***** // send a stream(*****) to connect 000, length is (n)
at+isst:000 // Number of bytes pending, or negative for link error
at+isrcv:000<cr> // receive data from connection 000
at+iscls:000<cr> // close the connection 000
```

#### 4.1.4. TCP Server

```
at+ihsrv=""<cr> // clear the parameter
at+ilprt=port<cr> // setting the listen port
at+istyp=0<cr> // TCP protocol
at+ipars<cr> // parameters save
at+i!snmd<cr> // switch to Serial NET mode
```

**Note:** TCP Server must use always online function, please put jumper to the

*pin of watch dog, and refer follow chapters for detail.*

## 4.2. UDP Transmit

### 4.2.1. UDP Always Online

```
at+istyp=1<cr> // UDP protocol
at+ihsrv=ip:port<cr> // set opposite IP and port
at+ipars<cr> // parameters save
at+i!snmd<cr> // switch to Serial NET mode
```

### 4.2.2. UDP Trigger Online

```
at+istyp=1<cr> // UDP protocol
at+ihsrv=ip:port<cr> // set opposite IP and port
at+iiato=n<cr> // n=Integer, the DTU will
// offline when the connect no
// data transport in (n) seconds

at+itup=1<cr> // set it to trigger up mode,
// refer chapter 8 for detail

at+ipars<cr> // parameters save
at+i!snmd<cr> // switch to Serial NET mode
```

*Note: changes to Serial Net mode, the AT command don't have "!"*

### 4.2.3. UDP Step by Step

```
at+isudp:ip,port:lport<cr> // establish a UDP connection by
// command. Send data to
// ip&port, receive data from
// lport

I/(000) // 000 is handle of the
// connection

at+issnd%:000,n:***** // send a stream (***** ) to
// connect 000, length is (n)

at+isst:000 // Number of bytes pending, or
// negative for link error

at+isrcv: 000<cr> // receive data from connection
// 000

at+iscls: 000<cr> // close the connection 000
```

## 5. Common Function

### 5.1. Ping

```
at+ipds1=220.192.32.103<cr> // setting primary destination
at+ipds2=220.192.0.130<cr> // setting backup destination,
// when first destination reply
// time out

at+ipds1=www.sina.com<cr> // setting primary destination
```

```
at+ipds2=www.21cn.com<cr> // setting backup destination,
                             when first destination reply
                             time out
at+ipgt=10000<cr> // setting timeout
at+ipfr=n<cr> // setting frequency to send
                ping packet
at+ipars<cr> // parameter save
```

**Note:** The function is only for Serial NET always online mode, detect whether online by period sending ping packet. Redial up when be detected offline. In Chinese mainland, China Unicom gateway filter the ping packet to Internet, so the user should set the destination to China Unicom' DNS.

**Common China Unicom DNS: 220.192.32.103/220.192.0.130**

## 5.2. Baud Rate

```
at+ibdrf=<rate><cr> // the command mode baud rate
at+isnsi="<rate>,8,<parity>,1,0"<cr> // the send mode baud rate
at+ipars<cr> // parameter save
```

<rate>	Baud Rate
3	2400
4	4800
5	9600
6	19200
7	38400
8	57600
9	115200

<parity>	Description
n	no parity
o	odd parity
e	even parity

**Note:** the baud rate will take effect after setting, save and reboot.

## 5.3. Setup APN or VPDN

### 5.3.1. Setting APN Configuration

Only for CH-D1G2 GPRS DTU.

```
at+imis="at+cgdcont=1,ip,****"<cr> // Setting network(APN)
at+iusrn="****"<cr> // user name
at+ipwd="****"<cr> // password
at+ipars<cr> // parameter save
```

### 5.3.2. Setting VPDN Configuration

Only for CH-D1C1 CDMA DTU.

```
at+iusrn="****"<cr>           // user name
at+ipwd="****"<cr>           // password
at+iath=n<cr>                 // n=1(PAP), 2(CHAP) Network
                              // certification mode , need to
                              // consult for the UN
at+ipars<cr>                 // parameter save
```

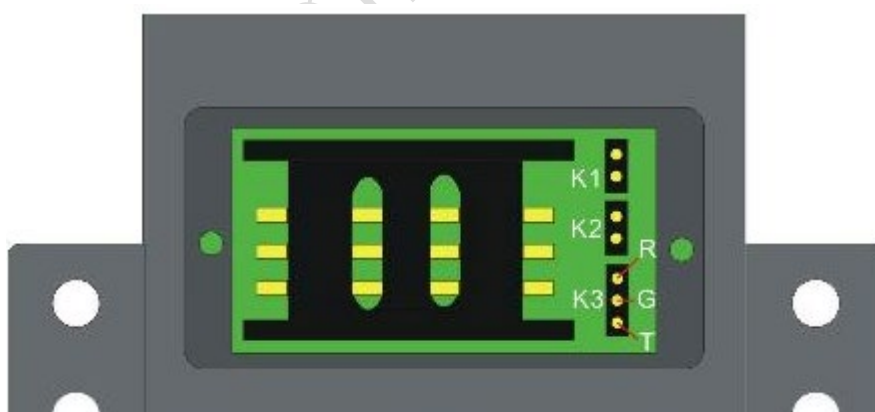
### 5.4. Transmit Mode

```
at+itup=0<cr>                // disable the function
at+itup=1<cr>                // trigger up mode
at+itup=2<cr>                // always online mode
```

*Note1: at+itup=2 are for common Serial NET, auto redial up when offline; at+itup=1 is for Serial NET with trigger up, offline when no data transfer in a period (refer chapter 9 for detail), and trigger up by some signal list below: 1 detect data need to transfer in serial port. 2 detect a ring signal, such as the wireless module has been dialed.*

*Note2: When the DTU in the command mode, and at+itup=2, power on, in about 20~30 seconds the DTU should auto dial up, do not respond any command, If you don't want to wait, press a stream "+", to abort the DTU operation.*

### 5.5. Hardware Flow Monitor



Time out	K1	K2
∞	Open	Open
15 mins	Open	Close
30 mins	Close	Open
5 mins	Close	Close

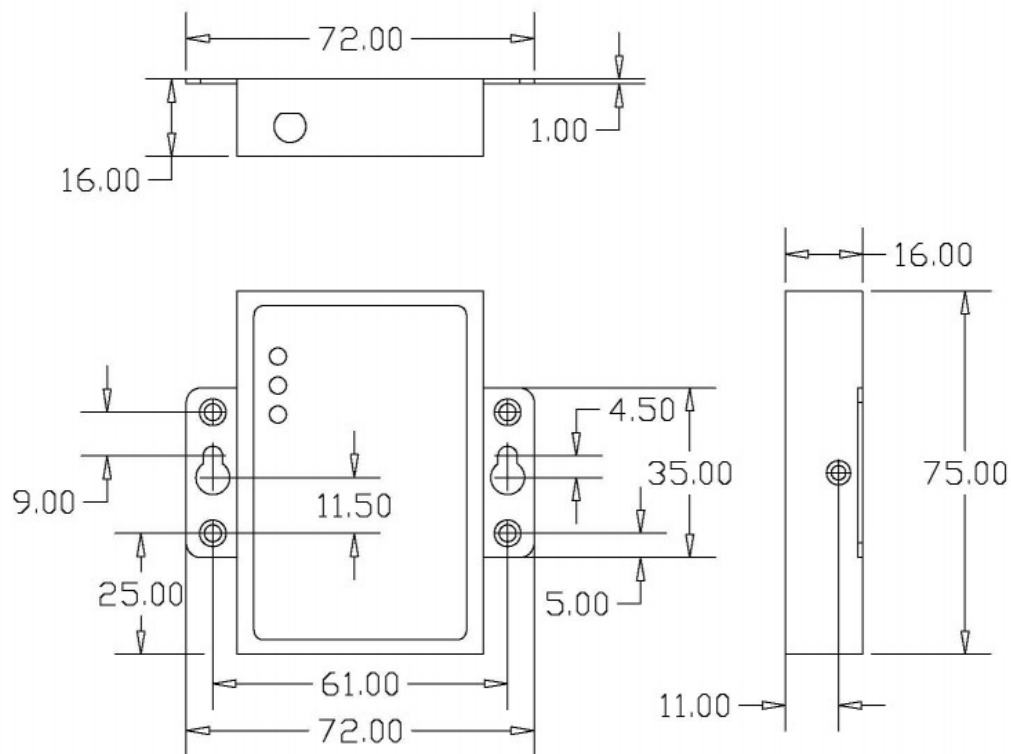
K3	Describe
RG Shortcut	Monitor receive
GT Shortcut	Reserve
Empty	Reserve

## 5.6. Software Flow Monitor

```
at+iiato=n<cr> // n>60 (second), offline when
                 no data transfer (both send &
                 receive) in the setting time.
```

*Note: In the common Send Mode and at+itup=2, the DTU should re-online immediately. In the Serial NET with trigger up and at+itup=1, the DTU should be offline until be trigger up*

## 6. Three-view Drawing



## 7. Product List

Name	Unit	Quantity	Describe	Picture
------	------	----------	----------	---------

<b>CH-D1</b>	Item	1	Device	
<b>Power Adapter</b>	Item	1	DC 12V1A	
<b>RS-232 Cable</b>	Item	1	Standard Supply	
<b>Antenna</b>	Item	1	Standard Supply	

## 8. Appendix A

### 8.1. CH-D1G2 reset to default parameters

```
at+ifd
at+ibdrm=9
at+ibdrf=5
at+imtyp=2
at+iflw=2
at+imis="at+cgdcont=1,\"ip\", \"cmnet\""
at+iispl=*99**1#
at+irto=5
at+irdl=20
```



```
at+ipwd=wap  
at+iusrn=wap  
at+itup=2  
at+imttf=200  
at+ipars
```

## 8.2. CH-D1C1 reset to default parameters

```
at+ifd  
at+ibdrm=9  
at+ibdrf=5  
at+imtyp=2  
at+iflw=2  
at+imis="at&d2"  
at+iisp1=#777  
at+irto=5  
at+irdl=20  
at+ipwd=card  
at+iusrn=card  
at+itup=2  
at+imttf=200  
at+ipars
```

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