A-GPRS1090I User's Manual



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Chapter 1 Introduction

1.1 Overview

GPRS is short for General Packet Radio Service, it has superiority owe to its high-speed transmit and always online, and it is very fit for the situation that there are much data to transmit but the time is not continuous.

GPRS1090I data acquisition is an extension of PC-based data acquisition to measurement applications where cables are inconvenient or uneconomical.GPRS1090I data acquisition (DAQ) devices combine TCP/IP communication; the flexibility of driver software for remote monitoring, physical, mechanical, and acoustical signals. GPRS-1090I makes it easy to incorporate wireless into new or existing PC-based measurement or control systems.

Operating System Support

The operational under most popular operating systems such as windowsxp/2000/2003/Vista etc. however, ART device drivers provide easier installation, configuration and better performance for windowsXP, windows2000/2003, Vista, Please refer to the respective operating system's manual for how to install and configure the standard driver.

Wide Applications

A-GPRS1090I module has a wide range of applications, following are some typical applications:

- 1 Power Down Automatically Meter System
- 2 Environment Monitoring System
- 3 Urban Street Lamps Lighting System
- 4 Industrial Automation Control System

1.2 Features

- Support Dual-band GSM/GPRS;
- Transparent Data transmission: build-in TCP/IP protocol stack, provide RS-232/485 interface, provide transparent transmission channel
- Support data center dynamic domain name or IP address access
- Support three working mode: on-line forever, idle offline, and idle power-off
- Support the function that can be woken up by text message and mobile telephone
- Support the automatic re-connection function
- Support local and remote graphical interface for configuration and the maintenance
- Reliable design of multiple hardware and software, and build-in the watchdog
- Supply single voltage from $+7V \sim +26V$ (Recommended $+9V \sim +12V$)
- Maximum operating current 300mA, and the sleep time≤10mA
- Operating Temperature: $-20^{\circ}C \sim +70^{\circ}C$

■ Operating Humidity: 90%

1.3 Hardware Introduction

A-GPRS1090I diagram is as follow:



The side of schematic diagram:



1.3.1 Serial Communication

1) RS232 Interface



If it is used with DAM3210, we need to use cross serial cable; if it is connected with PC to configure parameters, we should use direct-attached serial cable.

2) RS485

If RS485 uses 9D interface, shown as the following:



Otherwise, we also can lead out RS485 interface through 3P terminal, the side of schematic diagram:



The definition of 3P terminal



1.3.2 Indicator Light

NET: Network status indicator, on for normal PWR: Power indicator, on for normal ACT: GPRS status and communication indicator

1.4 Dimension

Case Size: 98mm (L) * 64mm (W) *24mm (H)

The detailed dimension of RS485 interface (9D interface) shown as the following:



The detailed dimension of RS485 interface (3P terminal) shown as the following:



The side (indicator) dimension is shown as the following:



1.5 Check List

Unpack the A-GPRS1090I series package, you should find the following items:

1 A-GPRS1090I data acquisition module

2 Device driver diskettes:

a) Driver;

b) User's manual (this manual).

3 One serial port cable.

4 One 9V Power Supply.

1.6 Installation Guide

Methods about how to install A-GPRS1090I in different operating systems are the same, our company provides a CD-ROM that contains the installation program "Setup.exe", and users double-click the installation program, then through the prompting of the interface to complete the installation.

Chapter 2 Parameter Configuration

We have three ways to configure parameters of A-GPRS1090I: these are local COM port configuration, long-distance configuration and message configuration.

2.1 Local Serial Port Configuration

There two configuration methods: GPRS-Config.exe configuration program or AT command.

There are two ways can enter to the local configuration mode, show as follows.

1 **When DTU power-on:** when give the power to DTU, it will check whether there is space in the serial port, if there is space, that the user requested access to the configuration mode. Therefore, we only need to send space to serial port continuously before give the power to DTU (baud rate 115200, 8-bit data bit, 1 stop bit, noparity), and then give the power to DTU, you can enter the local serial port configuration mode.

Note: If it receives character "e" when give the power to DTU, it will rest DTU; if it receives character "a", we can do AT mandate for SIM300.

2 When DTU normal working: when DTU is in a normal communication status, we can send characters in table 2.1 to DTU through serial port to make DTU exit present work mode, and then enter the configuration mode.

Pre-idle time	Character	Idle interval time
Least 100ms	+++ is set \r\n	Least 100ms

2.1.1 GPRS-Config.exe Configuration Program

The methord of A-GPRS1090I enters to the configuration mode: (first do not give the power to module)

1 Connect the COM port with the module.

2 Click the "enter configuration status" button, and then give power to A-GPRS1090I quickly. (Show as the following)

GPRS Configuration Tool V6.01.19					
	1				
🖻 Local Setting 🔨	COM	0014			
Module type	LOM	CUM1 📉 🚩			
Device ID	Baud Rate	115.2 kbps 🗸			
Device software version					
Device name	Data Bit	8 💙			
SIM card number		1			
Work mode	Stop Bit	1 •			
Module Type	Paritu Bit	None 🗸			
Transfer mode	T any Dic				
Goal Setting					
Data Certer Number	Enter	configuration			
DNS1		ooringaration			
DNS2	Evit configuration				
Main Data Center IP					
Main Data Center Domain	Californation				
Main Data Center Port No.	Get information				
Main Data Center link Mode					
Backup Data Center IP	Save setting				
Backup Data Center Domain					
Backup Data Center Port No.	Reset DTU module				
Backup Data Center link Mode					
The number of reconnection	Restore factory Setting				
The number of reconnection interval					
The two batches of target is heavy connect interrupt interval	Export	t configuration			
Transmission control					
COM Baud Rate	Import	t configuration			
COM Data Bit length					
COM Stop Bit length					
Serial Check Type					
Heartbeat Package Interval(s)	Language	English 💙			
Heartbeat Package Timeout(s)					
COM Stop Bit length	(2) 阿	尔泰科技			

3 Click the "get information" button, then we can read the information of module, or we can wait for seconds because it can get information automatically.

4 In the left of user interface, there is a "local COM port configuration" tool, we can change the information in it, when it has been changed, we can save new information by clicking the "save configuration" button.

2.1.2 AT Parameter Configuration Protocol

After DTU into the configuration mode, accordingly we can send command frames with configuration message, by command frames we can read or write parameters. Command frames all use ASCII characters. This not only gives the user convenient to use hyper terminal for parameter configuration in absence of configuration tool, but also allows users to write the DTU configuration program in their own device easily. Command frame structures are shown in Table2.1.4-1. There are two types of command, write commands and read commands. Write commands are used to configuration parameters, read commands are used to query the current configuration. The difference between them is that read commands are not with configuration parameters and characters after the command are different. Write

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commands "=" said the assignment. Read command "?" said the question.

Command codes are different because the configuration objects are different, but these codes must comply with requirements of regulations (show as Table 2.1.4-2). If use other command codes, DTU will return "ERR CMD", for another way, if write command with parameter configuration is not illegality (for example the baud rate has surpassed the scope of requirement), then DTU will refuse to receive this parameter and return "ERR DATA".

Note:

- 1 The data in command frame is all ASCII characters; all input characters are not case-sensitive
- 2 Command codes, according to Table 2.1.4-2
- 3 Write command frame length, according to Table 2.1.4-2.

Table2.1.4-1							
Command	Frame Type	Format					
Write C	Command	AT+ command code=parameter					
	Right	OK\r\n					
Write Response	Command mistake	ERR CMD\r\n					
	Parameter mistake	ERR DATA\r\n					
Read Command		AT+ Command Code?\r\n					
Read I	Response	Command Code =Parameter\r\n					

Tabl	le2.	1	.4	-2
		_	• •	_

Function name			code	length	Settings
	Module type	R	DTUTYPE	10	Such as ART1090I
	Device ID	R	DTUID	15	unique ID, can not be changed
	Device software version	R	SWVER	5	Such as V1.00
Local COM	Device name	RW	DTUNAM	15	Such as ARTDTU01
Configuration	SIM card number	RW	PHON	11	Such as 15810437433
	Work mode	RW	MODE	1	0:onlineforever1:idle
	work mode		MODE	1	winding2:idlepower-down
	Mada tuma	RW	DTUMODE	1	0:client1:server 2:CSD client
	Mode type		DIUMODE	1	3:CSD server
	Transport Mode	RW	DATMODE	1	
Goal Setting	Data Center number	RW	SVRCNT	1	1~2
	DNS1	RW	DNS1IP	15	Such as 202.106.0.20
	DNS2	RW	DNS2IP	15	Such as 211.136.17.107
	Main Data Center IP	RW	SVRIP	15	Such as221.218.157.55
	Main Data Center Domain	RW	SVRNAM	40	Such as "www.sohu.com"
	Main Data Center Port No.	RW	SVRPORT	5	Such as 80

10

	Main Data Contar Link Mada	RW	SVPMODE	1	0: TCP connection
	Main Data Center Link Mode	KW	SVKWODE	1	1: UDP connection
	Backup Data Center IP	RW	SVR1IP	15	Such as 192.168.0.1
	Backup Data Center Domain	RW	SVR1NAM	40	Such as "www.163.com"
	Backup Data Center Port No.	RW	SVR1PORT	5	Such as 80
	Backup Data Center Link	DW	SVD1MODE	1	0: TCP connection
	Mode	κw	SVKIMODE	1	1: UDP connection
	The number of reconnection	RW	TRYCNT	2	1~99
	The number of reconnection interval	RW	TRYTIM	5	10~65534s
	Two batches of target reconnection interrupt interval	RW	TRYSPAC	5	
	COM Baud Rate	RW	SERBAUD	6	300~115200
	COM Data Bit length	RW	SERDAT	1	5~8
	COM Stop Bit length	RW	SERSTP	1	1~2
	Serial Check Type	RW	SERCHK	4	
Transmission	Heartbeat Packet Interval	RW	BEATTIM	5	30~65534s
Control	Heartbeat Packet Timeout	RW	BEATOUT	5	30~65534s
	Heartbeat packet data setting	RW	BEATDATA	2	One byte of Hex, such as: FE
	Frame interval	RW	SERS	5	
	Packet Maximum Length	RW	MTU	4	1~1024 byte
	Idle offline time	RW	IDLETIM	5	30~65534ms
	APN	RW	APN	20	Default empty
	APN User Name	RW	USRNAM	20	Default empty
	APN Password	RW	PWD	20	Default empty
Natwork	SMS Center No.	RW	SMSNO	14	Default empty
Darameters	Local Port No.	RW	LCOPORT	1	Default "2020"
Farameters	SMS Certification User 1	RW	USERNO1	14	
	SMS Certification User 2	RW	USERNO2	14	
	SMS Certification User 3	RW	USERNO3	14	
	Module Password	RW	DTUPWD	6	ON: putout
Control Command	Debugging information output	RW	DBGINF	3	ON: putout

2.2 Long-distance Configuration

<u>⊂</u> ontrol Terminal	<u>M</u> anage <u>S</u> ettings	Test Record Manage	Language	Help				
0	COM Number(IN	Link Test	tate f-line	Connection Time	Terminals IP addr	Send	Receive	Mapping
Start Server		Remote Configure Remote Update						
Stop Server								
Add Terminal								
Delete Terminal								
Terminal Property								
Sever Settings								
Mapping Manage	<							1
	System informati	on Terminal information						
		Information						

Remote configuration using ARTServer service program, show as figure:

Ethernet Remote Configure		
Send frame		
	Comman	AT+CFGLIST 🔽
	Read only	
	Parameter	
	Explain: Bead all th	e commands and
	Clear Clear Bead only	values,
		<u>×</u>
串号:1234567896666666 A A B A B A B A B A B A B A B A		
	Send	Clear
Receiv	ve frame	
		~
		~
ОК	Cancel	

2.3 Message Configuration

SMS configuration is a mobile phone, enter commands to configure, but please note:

Note:

One message only can send one command, format is: 6 passwords +":"+ command (without the prefix "AT +"). All characters are Western. Not only the telephone number is the same as certification number, but also the passwords have been passed, then SMS configuration can work. SMS wake-up command "WAKEUP". SMS Configuration Support Telephone wake-up: telephone call's time must over two rings, and was hung up after the wake-up.

Chapter 3 Function Settings Description

Export Configuration

Save the modified configuration items.

Import Configuration

Load the configuration items previously saved.

Reset DTU Module Software reset actions will be executed.

Restore Factory Settings

Restore module to factory settings in case of configuration confusion.

SWVER

Software version.

DTUNAM

DTU device name, be used to distinguished different devices when multiple modules are being used. DTUNAM limited to 15 characters.

SIM Card Number (PHON)

Mobile phone number, 11 ASCII characters, such as "15810437433".

MODE

There are three modes for A-GPRS1090I:"Always online", "Offline when idle", "Power down when idle".

- Always online: It will connect to the preconfigured server when power on the module. And it will be kept online all the time so the data can be transmitted at any time.
- Offline when idle: It will connect to the preconfigured server when power on the module. The module will disconnect and turns to the sleeping mode if there isn't any data in a period of time. There are three methods to enable re-establish connection between the module and the server.
 - 1. Send data to the serial port of the module, the module will connect to the server and then send the out. .
 - 2. Telephone wake-up: call the SIM card number, hang up after it rings for two times, the module will re-establish a connection with the server
 - SMS wake-up: set one of the SMS certification users to the SIM card number in the Configuration Tool. The format of the number is "+861*******". (for China's SIM card, it is 86) Send the SMS "888888: Wakeup". It will return "OK" which means the module has re-connected to the serve.
- Power down when idle: after the module disconnecting the connection with the server, the module will cut off the power of GPRS module, and make the system into power-down status to achieve low power consumption

There is only one method to wake up the module: send data to the serial port of the module, the module will connect to the server after the data is sent successfully.

DTUMODE

This parameter is used to set the module's functionality mode, "CLIENT" or "SERVER". For "CLIENT" mode, the module connects the data center server as a client. For "SERVER" mode, the module wait for the connection from the client as a server. When use the point to point function, configure one module "CLIENT", and the other "SERVER".

SVRIP, SVRNAM, SVRPORT, CNTMODE (the parameters of the main center server)

A target server configuration includes IP address and port number, if the server does not have a fixed IP address, you can use the domain name. When the server IP address is validity, the domain name will be ignored. In communication network, it has TCP and UDP communication.

SVR1IP1, SVR1NAM1, SVR1PORT1, CNTMODE1 (the parameters of the secondary center server)

A target server configuration includes IP address and port number, if the server does not have a fixed IP address, you can use the domain name. When the server's IP address validity, the domain name will be ignored. In the several attempts to connect the main central server fails, the module will automatically switch to connect alternate central server. When using the standby server, if it suddenly disconnected during the remote configuration, the module will re-connect standby server. If it suddenly disconnected in operating mode, the target server will switch back to the main central server.

TRYCNT, TRYTIM, TRYSPAC

The number of target re-connection, used to control the number of the same goal connection of the connection with batch. "0" stands for regardless of batch. The interval of target connection is used to control the time between two connections, the smallest time is 10s, and the longest time is 65.5536s. The interruption interval of target connection is used to control the time of two groups' connections, the smallest is 1 minute, and the longest is 65,534 minutes.

SERBAUD

Serial baud-rates.

Table3.13 Supported baud-rates									
Standard baud-rate									
300	600	1200	2400	4800	9600	19200	38400	57600	115200

SERDAT, SERSTP

Serial data bit (stop bit) length.

SERCHK

Check type of serial.

Table3.15 relationship between values and checking types

Baud-rate	No checking	Odd checking	Even checking	Compulsory to 1	Compulsory to 0
Set value	NON	ODD	EVEN	1	0

BEATTIM

Users can set heartbeat packet interval time, the range is $30 \sim 65534$ (unit: seconds).



BEATDATA

User can manually set the heartbeat data, such as: "0x3F", using the AT command configuration, format: "AT + BEATDAT = 3F".

SERS,MTU

Frame interval of time and the maximum length of data packets

IDLETIM

Idle time of downline.

APN,USRNAM,PWD

APN name, user name, and password.

LCOPORT

Local port number.

DTUPWD

Login Password.

DBGINF

This parameter controls whether the data input is "echo" and whether there are "debug information" outputs.

Chapter 4 Server program

4.1 Overview

ARTServer is a wireless communication server application which is running on Windows operating systems. A-GPRS1090I module is supplied by our company ,it can transmits communication between module and server, client connections, management, client mapping, data transmission and other functions can be realized by the server.

4.2 Usage Instructions

Application framework

Show as figure:

left ARTServer												X
<u>⊂</u> ontrol Terminal	<u>M</u> anage <u>S</u> ettings <u>T</u> est	<u>R</u> ecord M	anage Lan	guage <u>H</u> elp								
	COM Number(IMEI)	Name	State	Connection T	Terminals IP addr	Send	Receive	Mapping	Record	Heartbeat Interval	Heartbeat	
	123456789666666	Art	Off-line			0	0			30	120	-
Start Server												
0												-
Stop Server												-
Add Terminal												
0												-
Delete Terminal												_
												-
Terminal Property												
M												-
Sever Settings												-
\geq												-
Mapping Manage												-
												-
	System information T	erminal info	rmation									^
		Informat	tion									
Ready											NUM	V
And the second se												and the second s

Server Settings

Show as figure:

Service setting	×
Service setting	
Monitor port: 8000	
Most link: 100 (0 ~ 1000)	
Automatically starts DTU when Windows st OK Cancel	arts

Instruction:

1) Defaulting monitor port is 8000; the server program allows only one monitor port to the outside world, allowing 1000 clients to establish connection at the same time.

2) Users can also select "When Windows starts activated A-GPRS automatically ", and then when users open the computer, ARTServer will be activated automatically.

Add terminal

Wireless module through name and IMEI which is the unique identifier of module can be added in the server program of ARTServer, show as figure:

Add Terminal		×				
COM(IMEI)	123456789666666					
Name	Art					
Server Ap	ppoint Heartbeat parameter					
Heartbeat Interva	al 30 (30~65534)Sec					
Heartbeat Time:	120 (30~65534)Sec					
Add Cancel						

Instruction:

1 IMEI must be 15 bits.

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3 "Heartbeat interval" refers to the time of sending a terminal heart to ARTServer.

"Heartbeat overtime" means the terminal does not receive the heartbeat packets from ARTSever for seconds, and then it will think the module has been dropped. After has dropped the terminal it will determine next connection according to their own "try spacing" parameter. Heartbeat parameters ensure the terminal on line; the value can be set by users.

Delete terminal

Click the list box to delete the terminal, select the menu "Terminal Management | delete Terminal" or click the toolbar "terminal delete" button, pop-up dialog box to confirm the deletion. Clicks "Yes" while the terminal deleted.

Mapping management

ARTServer supports four mapping methods: terminal -to- terminal, terminal -to-local physical serial port, terminal to the local Virtual serial port, terminal to the local TCP port.

- 1 terminal -to- terminal mapping: two terminals exchange the data by ARTServer.
- 2 Terminal to the local physical serial mapping: ARTServer opens a specified and actual serial port, and then transmit data between terminal and the serial.
- 3 Terminal to the local virtual serial port mapping: ARTServer creates a virtual serial port, and then transmit data between virtual serial port and terminal.
- 4 Terminal to the local TCP port mapping: ARTServer opens a local server port, and then transmit data between terminal and the TCP port.

Show as figure:

Mapping Manage		
Mappi	Terminal name:	Art
	<-Mapping Mapping to:	Art
	COM:	COM1 💌
	Delete Mapping	COM configure
	TCP Port:	5000
		ОК

Instruction:

- 1 terminal own should not map, when map TCP ports, TCP port numbers are different.
- 2 Make sure that no program is opening the virtual serial port when we want to delete it.
- 3 If you want to delete the mapping, please click the "Mapping" to remove the one which you want to delete, and then click the "delete mapping" option.

Information

ARTServer has "system information" and "terminal information".

- 1. "System information" shows the total number of terminals and the number of online terminals.
- 2. "Terminal information" shows terminal connection status, heart rate, receive and send data.

System information	Terminal information	
	Information	
Clear Record	2010- 7-31 15:16:11 2010- 7-31 15:16:11	Start successful Server Listen Port: 8000, the maximum number of allowed connections:100
Save Record		
Look over record		

Chapter 5 Application Introduction

5.1 Protocol Transmission

5.1.1 Configuration Settings

- 1. First of all, select "Agreement transfer" of "transfer mode".
- DNS of "Server DNS1" and "server DNS2" has been set, if need, we can change it. (Default settings are: DNS1 = 211.136.17.107, DNS2 = 202.106.0.20).
- 3. "Master data center IP" uses the public IP (if we use the "main data center domain name", then the current item must be empty).

Note: the public network IP address changes every day, so it needs to be updated.

4. "Main data center domain," we can use software to application a domain name, by a third party to manage the domain name, it is more convenient for us.

Note: The "main data center IP" must be set to empty when we use the domain name to connect.

- 5. "Main data center port No.": The computer that is using "ARTServer.exe" application needs to open a port number and the port number is set in the current item.
- 6. Select TCP mode of "Main Data Center link Mode".

		figuration Too	1 112 04 4	0					
_	GPKS CUIT	riyuracium Tuu.		9					
Lo	ical COM Configur								
E	Local Setting			~	CON				
	Module type	ART1090			LUM	СОМ1 💙			
	Device ID	149241003604875			Baud Bate	115.2 kbps 🔽			
	Device software version	V1.00							
	Device name	ARTDTU01			Data Bit	8 💙			
	SIM card number	15810687274				1			
	Work mode	Always online			Stop Bit				
	Module Type	Client			Davitu Dit	None 🗸			
	Transfer mode	Agreement transfer			ганурк				
E	Goal Setting								
	Data Certer Number	1			Enter	configuration			
	DNS1	211.136.17.107			Entor	coningeration			
	DN52	202.106.0.20			Evity	configuration			
	Main Data Center IP	221.218.157.69			EXIC	coningulation			
	Main Data Center Domain				C	1. (
	Main Data Center Port No.	5000			Liet	Information			
	Main Data Center link Mode	TCP							
	Backup Data Center IP				Sa	ve setting			
	Backup Data Center Domain	www.art-control.com							
	Backup Data Center Port No.	4000			Reset	DTU module			
	Backup Data Center link Mode	UDP							
	The number of reconnection	3			Restore	factory Setting			
	The number of reconnection interval	10							
	The two batches of target is heavy co	1			Export	configuration			
E	Transmission control				<u> </u>				
	COM Baud Rate	115200	-		Import	configuration			
	COM Data Bit length	8							
	COM Stop Bit length	1							
	Serial Check Type	None							
	Heartbeat Package Interval(s)	100			Language	English 💙			
	Heartbeat Package Timeout(s)	300		*					
(COM Baud Rate ⑦阿尔泰科技								

- 7. Serial port settings: A-GPRS1090I provides a serial port to transfer the data; serial port configuration is shown as the following.
- 8. Heart rate settings:

"Heartbeat Package Interval": it will send a heartbeat in a certain time, the default value is "30s", and we can change it in the program.

"Heartbeat Package Timeout": the module will re-connect in timeout if there is no heartbeat. The default value is "120s"; we can change it in the program.

F	Goal Setting		~		
-	Data Certer Number	1	_	СОМ	COM1 💌
	DNS1	211.136.17.107		D 10.	115.011
	DNS2	202.106.0.20		Baud Hate	115.2 KDps 🚩
	Main Data Center IP	221.218.157.69		Data Bit	8 🗸
	Main Data Center Domain				
	Main Data Center Port No.	5000	_	Stop Bit	1 💙
	Main Data Center link Mode	TCP			None
	Backup Data Center IP			Parity Bit	None
	Backup Data Center Domain	www.art-control.com			
	Backup Data Center Port No.	4000		Eutor	C
	Backup Data Center link Mode	UDP		Enter	configuration
	The number of reconnection	3			
	The number of reconnection interv	10		Exito	configuration
	The two batches of target is heavy	1			
Ξ	Transmission control		_	Get	information
	COM Baud Rate	115200	=		
	COM Data Bit length	8		Sa	ve setting
	COM Stop Bit length	1			
	Serial Check Type	None		Reset	DTU module
	Heartbeat Package Interval(s)	30			
	Heartbeat Package Timeout(s)	120		Restore	factory Setting
	Heartbeat Package Data Set	254			
	Frame Interval (ms)	100		Export	configuration
	Packet Maximum Length	512		Lipon	coningenerici
	Idle offline time	60		Import	configuration
Ξ	Network Parameters				coninguration
	APN				
	APN User Name				
	APN Password			Language	English 🗸 🗸
	SMS Center No.		\checkmark		

5.1.2 ARTServer Server Program

Start \ all programs \ ART Data Acquisition Measurement Suite \ A-GPRS1090I \ ARTServer Service procedure 1. Click the "Service Settings" button to set the main server port number (the port number should be the same as the "Main Data Center Port No."), show as the following:

Service setting	
Service setting	
Monitor port:	8000
Most link:	100 (0 ~ 1000)
Automatically star	rts DTU when Windows starts

2. Click the "Start Service" button to create a master server. Show as the following:

le ARTServer										
<u>C</u> ontrol Termina	I <u>M</u> anage	<u>S</u> ettings	<u>T</u> est	<u>R</u> ecord Manage	Language	Help				
	COM	1 Number(IN	(EI)	Name	State	Connection Time	Terminals IP addr	Send	Receive	Mapping
Start Server										
Stop Server										
Add Terminal										
•										
Delete Terminal										
Terminal Property										
	<				1111					>
21	Syste	em informati	on Te	erminal information	1					
Sever Settings				Information						
		Clear Beer	vd	2010-8-215:3 2010-8-215:3	1:22 Start :	successful r Listen Port: 2000 the r		ed connection	os:100	
Mapping Manage		Clear Hecc		2010-0-2 13.3	1.22 Jeive				13.100	
		Save Reco	rd							
	L	ook over red	cord							
				<						
Ready	,								N	UM .

After seconds, the module connects the server successfully, show as the following:

langthe ARTServer		a									
<u>Control</u> Terminal <u>r</u>	COM Number(IMEI)	Record Manage	: Language	Connection Time	Terminals IP addr	Send	Bacaiva	Mapping	Becord	Heartheat Interval	Heartheat timeout
	149241003604875	DTU109×-0	On-line	2010-8-2 16:27:6	117.136.0.12	0	0	Mapping	Hecold	30	120
Ð											
Start Server	l										
0											
Stop Server											
Add Terminal											
0	System information Tr	erminal informatio	n								
Dolate Terminal		Information									
	Clear Record	2010- 8- 2 16: 2010- 8- 2 16: 2010- 8- 2 16:	6:37 Start 6:37 Serve 27:6 44000	successful er Listen Port: 5000, the <u>lie D</u> TU109X-0, has clie	Emaximum number of allow ant connection, IP:117, 136.	/ed connectio	ons:100				
Terminal Property	Save Record										
Sever Settings	Look over record										
	Terminal Amounts:										
Mapping Manage	1										
	On-line number:										
	1										
Ready											NUM

- 4 The server program realizes data transmission, and it can achieve physical serial port forwarding, TCP port forwarding, and virtual serial port forwarding.
- (1) "Physical serial port forwarding" test

Click the left "Mapping management" button, it will pop-up dialog box.

Mapping Manage		
Mappi	Termina	al name: DTU109X-0 💌
	<-Mapping Mapp	ping to: Physics COM 🗸
	CON	M: COM1 💌
	Delete Marsing	COM configure
		P Port: 5000
		ОК

Map the DTU1090I-0 which is new connection device to the physical serial port, serial number is COM1.

Click the serial configuration dialog box, show as the following: configure serial. (The "mapping" button is valid after configured the serial port)

Serial Port Configuration					
СОМ	СОМ1				
Baud rate	9600				
Data Bit	8 💌				
Check Type	None 🔽				
Stop Bit	1 💌				
ОК	Cancel				

Click the "Mapping" button, show as the following:

k	lapping Manage	9			
		Mappi			
	DTU109X-0	↔	Physics COM	Terminal name	: All terminals 🔽
				<-Mapping to:	TCP Port 💌
				COM:	СОМ1 💌
				Delete Mapping	COM configure
				TCP Port:	5000
					ОК

Then master service will add the physical serial port forwarding function:

le ARTServer											
<u>⊂</u> ontrol Terminal <u>(</u>	<u>M</u> anage <u>S</u> ettings <u>T</u> est	<u>R</u> ecord Manage	Language	Help							
	COM Number(IMEI)	Name	State	Connection Time	Terminals IP addr	Send	Receive	Mapping	Record	Heartbeat Interval	Heartbeat tim
Ð	149241003604875	DTU109×-0	On-line	2010-8-2 17:8:52	117.136.0.41	0	0	Physics COM		30	120
Start Server											
Ο											
Stop Server											
Add Terminal											
•											
Delete Terminal	<										
	System information Te	erminal information]								
Terminal Property		Information 2010, 8, 2.17	7:43 Close	Server Monitor port:500	in .						
X	Clear Record	2010- 8- 2 17: 2010- 8- 2 17: 2010- 8- 2 17:	7:50 Start 7:50 Serve	successful er Listen Port: 5000, the	maximum number of allov	ved connecti	ons:100				
Sever Settings	Save Record	2010-0-2 17.	0.32 MOUL	ale Diffortoakko, has cale	a connection, in 117, 136	.0.41					
Mapping Manage	Look over record										
	Terminal Amounts:										
	1										
	On-line number:										
	1										
Ready											NUM

★ Data distribution rules (physical serial port forwarding)

Open the serial port COM3 to connect A-GPRS1090I device, connect the physical serial port COM1 with another unoccupied serial port COM2, COM3 can send data to ARTServer, and then data is transmitted from the server to the COM1.

We can detect the uplink data that is sent by COM3 of A-GPRS1090I through "terminal information" of the server program; COM1 can connect with other devices to send the downlink data.

(2) "TCP serial port forwarding" test

Click the left "Mapping management" button, it will pop-up dialog box.

Mapping Manage	
Mappi	Terminal name: DTU109X-0 💌
	<-Mapping to: TCP Port
	СОМ: СОМ1
	COM configure Delete Mapping TCP Port: 5000
	ОК

Map the DTU1090I-0 which is new connection device to the TCP serial port, we can change serial number, the default number is 5000.

Click the "mapping "button, show as the following:

Mapping Manage		
Mappi ØTU109X-0 ←→ TCP Port6000	Terminal name: All terminals	~
	<-Mapping to: TCP Port	*
	сом: СОМ1	~
	Delete Mapping TCP Port: 6000	
	OK	

Then master service will add the TCP serial port forwarding function:

♦ ARTServer										
<u>⊂</u> ontrol Termina	Manage Settings Test	<u>R</u> ecord Manage	Language	Help						
-	COM Number(IMEI)	Name	State	Connection Time	Terminals IP addr	Send	Receive	Mapping	Record	Heartbeat Interval
6	149241003604875	DTU109X-0	On-line	2010-8-2 17:16:59	117.136.0.43	1	0	TCP Port6000		30
Start Server										
Stop Server										
Add Terminal										
U										
Delete Terminal	<									2
	System information Tr	erminal information	1							
Terminal Property		Information								
V	Clear Record	2010- 8- 2 17: 2010-	7:43 Close 7:50 Starts	Server Monitor port:500 successful	0					
Zauer Settings		2010-8-217:2	7:50 Server 3:52 Modul	rListen Port: 5000, the Ie DTI 1109X-0, has clier	maximum number of allow t connection IP:117.136	ved connectio	ons:100			
Devel Decangs	Save Record	2010-8-217:1	5:23 Stat	TCP Port mapping succ	ess, Port 6000 >	0.42				
		2010-0-2 17.1	6.55 MOQU	le Di o roavio, nas cile	ni connection,in 117,136	.0.43				
Mapping Manage	Look over record									
	Terminal Amounts:									
	1									
	Un-line number:	<								
Ready										NUM .;

★ Data distribution rules (TCP serial port forwarding)

Open the COM1 to connect with the serial port of A-GPRS1090I, then COM1 can send the data to the ARTServer, then ARTServer can transmit data to the serial port 5000 of TCP.

Open "Network Debugging Assistant", we can use it as client to connect with serial port 5000 of TCP, in this way, it can realize data transmission. Show as the following:

📲 1,0,0,7 - icetc	p		
Help			
TCP UDP			
4F 4B 0D 0A			9
<		×	
Setting		View Options	
Client ©	C Server	I → Hex RX:4, TX:12	
Remote Host	127.0.0.1	- Transmit Options	
Port	6000	F Hex Auto ms AutoAck Send	
Connect	Close Connect	00 00 00 00 06 00 02 00 00 00 08	
Connected: 1	27.0.0.1:6000	2649.848228ms Status: 1	

We can detect the uplink data that is sent by COM3 of A-GPRS1090I through "terminal information" of the server program; the serial port 5000 of TCP sends the downlink data. Shown as the following:

(3) "Virtual serial port forwarding" test

Click the left "Mapping management" button, then it will pop-up dialog box.

Mapping Manage		
Mappi	Terminal name:	DTU109X-0 💌
	<-Mapping Mapping to:	Virtual COM 🔽
	COM:	СОМ6
	Delete Mapping	COM configure
	TCP Port:	5000
		OK

Map the DTU1090I-0 which is new connection device to the virtual serial port, serial port is COM6. Click the "mapping "button, show as the following:

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Mapping Manage		
Mappi D10109X-0 ←→ Virtual COMC>	Terminal name:	All terminals
	Kapping Ko:	Virtual COM
	COM:	СОМ6
	Dalata Manajira	COM configure
	TCP Port:	5000
		OK

Main server program will add virtual serial port function:

le ARTServer										
<u>⊂</u> ontrol Terminal	<u>M</u> anage <u>S</u> ettings <u>T</u> est	<u>R</u> ecord Manage	Language	Help						
	COM Number(IMEI)	Name	State	Connection Time	Terminals IP addr	Send	Receive	Mapping	Record	Heartbeat Interval
$\mathbf{\Omega}$	149241003604875	DTU109X-0	On-line	2010-8-2 17:16:59	117.136.0.43	1	0	Virtual COMCOM6	>	30
Chart Soruer										
Start Server										
Stop Server										
Add Terminal										
Delete Terminal	<									>
	Sustem information T	- 11 ¢ - 11								
Torminal Droportu	System montation 1	Information	1							
		2010- 8- 2 17: 1	7:43 Close	Server Monitor port:5000	l					
	Clear Record	2010- 8- 2 17: 1 2010- 8- 2 17: 1	7:50 Startis 7:50 Servei	uccessful : Listen Port: 5000, the r	naximum number of allow	ed connectio	ons:100			
Sever Settings		2010-8-217:0	8:52 Modul 5:23 Start	e DTU109X-0, has client ICP Port manning succe	connection,IP:117.136.	0.41				
	Save Record	2010-8-217:1	6:59 Modu	le DTU109X-0, has clien	t connection,IP:117.136	.0.43				
	Look over record	2010- 0- 2 10. 1		indar com mapping suc	Cess, COM.6					
Manage	LOOK OVER RECOID									
	Terminal Amounts:									
	1									
	On-line number:									
	1	<								
Ready										NUM

★ Data distribution rules (virtual serial port forwarding)

Open the COM1 to connect with A-GPRS1090I, COM1 can send data to the ARTServer, and then ARTServer can transmit data to the virtual serial port COM6.

We can detect the uplink data that is sent by COM1 of A-GPRS1090I through "terminal information" of the server program, the virtual serial port COM6 sends the downlink data. Shown as the following:

5.2 Transparent Transmission

5.2.1 Configuration Settings

1 First set the "transferring mode" to the "transparent transmission."

2 Others are the same as "protocol transmission".

Note: in this mode, data packets do not have the header.

5.2.2 Server Configuration

Use "Network Debugging Assistant "to create a server, open a port, the port number is the same as the port number of module configuration program. Show as the following:

9/4 1,0,0,7 - icetcp		
Help		
· · ·		
<		
Setting	View Options	
C Client @ Server		
Bemote Host 127.0.0.1		
	Transmit Options	
Port 5000	Frex 🗆 Auto 0 ms 🗆 AutoAck Send	
Stop Close Connect	00 00 00 00 00 06 00 02 00 00 00 08	
Listening	17204475.222592ms Status: 2	
Lincolling		

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Give the power to A-GPRS1090I, waiting until the module connects with the server. Show as the following:

👀 1,0,0,7 - icetcp	
Help	
TCP UDP	
04 00 1E 31 34 39 32 34 31 30 30 33 36 30	0 34 38 37 35 01 2C 00 64 0A OF A7 0E 00 00 00 00
<	∑
Setting	View Options
C Client C Server	✓ Hex RX:30, TX:0
Remote Host 127.0.0.1	Transmit Options
Port 5000	F Hex Auto ms AutoAck Send
Stop Close Connect	00 00 00 00 06 00 02 00 00 08
Connected: 117.136.0.9:55575	17204475.222592ms Status: 3

 \star Data distribution rule (transparent transmission)

Open COM1 to connect with A-GPRS1090I, COM1 can send uplink data to the server; the server sends the downlink data to the serial port COM1.

Chapter 6 Fault Diagnosis

The following are a series of common faults of GPRS1090I, possible causes and solutions. If the problem persists, users can directly connect with the ART in order to get technical support.

1 The module can not work well; possible reasons are in the following:

- a) The antenna does not contact well;
- b) The SIM card does not contact well;
- c) The SIM card does not have the money;
- d) The network is not connection or the speed is too slowly.
- e) Public Network IP has changed or oray has disconnected.
- 2 when working a period of time, the module short-terms automatically, the possible reasons are in the following:
 - a) The Network is not connecting well;
 - b) If using Public Network, it maybe the Public Network has changed;
 - c) The SIM card does not have the money;
 - d) The module receives too many data in one time.