GT-540-0EM1

Intelligent GPRS Data Server

User Manual v1.1





High Quality, Industrial Data Acquisition, and Control Products

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| Version | Date | Author | Description |
|---------|------------|--------|-----------------|
| 1.1 | 2010/02/23 | Alung | Release version |

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1. Introduction

GT-540-OEM1 is an intelligent GPRS Device Terminal Unit based on GPRS connection providing data transparent tunnel. By applying GT-540-OEM1, it is convenient to allow your devices to connect to Internet easily. It is not need to build expensive fixed line network, saving cost substantially.

1.1 Features

- Quad-band 850/900/1800/1900 MHz
- Support E-Mail Transmission Via GPRS
- Support Reconnect Function
- Support Save Electronic Function
- Support Graphic Utility
- Support DC +10 V_{DC} ~ +30 V_{DC} Power Input
- Built-in Watch-dog Function
- Industrial Design with Surge Protection
- Support microSD Storage Card
- Support automatic I/O signal data logging

1.2 Applications

- IO Signal Date Log
- Modbus Device

Application: Data log and E-mail communication



2. Hardware

2.1 Specifications

| System | | | | | |
|----------------------------|---|--|--|--|--|
| CPU | 32 bit Arm7 CPU, 72 MHz | | | | |
| SRAM | 32 KB | | | | |
| Flash Memory | 512 KB | | | | |
| DTC | Gives time(sec, min, hour) & date, leap year compensation | | | | |
| KIC | from 1980 to 2079 | | | | |
| WDT(watchdog) | Yes | | | | |
| Serial ports | | | | | |
| COM2 | RS-232 : TxD,RxD,GND for configuration | | | | |
| COM2 | RS-485 : Transparency for communication with ICP DAS | | | | |
| COMIS | Modbus RTU devices | | | | |
| DIO | | | | | |
| | 6 Channel | | | | |
| Input | On Voltage: +3.5~24VDC | | | | |
| | Off Voltage: +1V Max. | | | | |
| | D/O :2 Channel (isolation) | | | | |
| Output | Load Voltage: +24V Max. | | | | |
| | Load Current: 100 mA Max. | | | | |
| GPRS/GSM Modul | le | | | | |
| | GPRS/GSM Tri-Band 900/1800/1900 MHz | | | | |
| | GPRS multi-slot : class 10/8 | | | | |
| | GPRS mobile station : class B | | | | |
| | GPRS class 10 : Max download speed 85.6 kbps | | | | |
| GPRS/GSM | CSD max speed 14.4 kbps | | | | |
| | Compliant to GSM phase 2/2+ | | | | |
| | -Class 4(2W @ 900 MHz) | | | | |
| | -Class 1(1W @ 1800/1900 MHz) | | | | |
| | Coding schemes : CS 1, CS 2, CS 3, CS 4 | | | | |
| Power | | | | | |
| Protection | Reverse polarity protection | | | | |
| Frame Ground Protection | ESD, Surge, EFT, Hi-Pot | | | | |

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| Required Supply Voltage | $+10 V_{DC} \sim +30 V_{DC}$ | | | | |
|----------------------------|------------------------------|--|--|--|--|
| Mechanical | | | | | |
| Casing | Plastic | | | | |
| Flammability | UL 94V-0 materials | | | | |
| Dimensions (W x H x D) | 91 mm x 132 mm x 52 mm | | | | |
| Installation | DIN-Rail | | | | |
| Environment | Environment | | | | |
| Operating Temperature | -25 °C ~ +55 °C | | | | |
| Storage Temperature | -40 °C ~ +80 °C | | | | |
| Humidity | 5 ~ 95% RH, non-condensing | | | | |

2.2 Appearance and pin assignments

Pin assignments :



| DI/DO | | | |
|-----------------|----|-------------------|--|
| Terminal No. | | Pin Assignment | |
| | 01 | DI0 | |
| DI | 02 | DI1 | |
| | 03 | DI2 | |
| | 04 | DI3 | |
| | 05 | DI4 | |
| | 06 | DI5 | |
| DI COM | 07 | DI COM | |
| DO PWR | 80 | DO PWR | |
| | 09 | DO0 | |
| ЪО | 10 | DO1 | |
| DO GND | 11 | DO GND | |
| - | 12 | - | |
| Ain+ | 13 | Ain+ | |
| Ain- 14 | | Ain- | |

| COM Port & Power Input | | | | | |
|-------------------------|----|-------------------|--|--|--|
| Terminal No. | | Pin Assignment | | | |
| Ground for COM | 01 | GND | | | |
| COM2 | 02 | RxD2 | | | |
| RS-232 | 03 | TxD2 | | | |
| COM3 | 04 | D+ | | | |
| RS-485 | 05 | D- | | | |
| Deeet | 06 | RST+ | | | |
| Resei | 07 | RST- | | | |
| Power Input: | 08 | DC.+VS | | | |
| +10 ~ 30V _{DC} | 09 | DC.GND | | | |
| Frame Ground | 10 | F.G | | | |

2.3 Dimensions



2.4 DI/DO Wire Connection



(1) DI Wire Connection

(2) DO Wire Connection



2.5 LED indicators

There are three LED indicators to help users to judge the various conditions of GT-540-OEM1. The description is as follows :

A. EXT(Red) : External Power LED to indicate whether the external power is input or not. The description is as follows:

| The external power is active | The external power is not active |
|------------------------------|----------------------------------|
| on | off |

B. STA(Orange) : System LED is to indicate if the GT-540-OEM1 is normal or fail.

| Normal | Device Fail | PIN code is wrong |
|------------------|------------------|--------------------|
| Blanking (1 sec) | Always on or off | Blinking per 50 ms |

C. GSM (Green) : The modem LED can indicate the status of GSM module.

| Modem normal | Modem fail |
|------------------|----------------------|
| | Off |
| Blanking (3 sec) | or |
| | Blanking (not 3 sec) |

2.6 Installing GT-540-OEM1

If users want to start GT-540-OEM1 normally, it needs to follow these steps to install the GT-540-OEM1 below:

- A. Install the antenna
- B. Plug in the normal SIM card (Before apply the SIM card, confirm it is OK by mobile phone.)
- C. Pin08 and Pin09 connect to the DC.+VS and DC.GND of the power supply.
- D. Follow the section 2.4 to wire the I/O connection.
- E. It is needed to wait for 30 ~ 50 seconds to search the GSM base and register to the ISP. After finishing the process, GT-540-OEM1 would be in normal operation mode and the STA LED would blank per 3 sec. The start time of GT-540-OEM1 depends on the strength of signal.



2.7 How to reset GT-540-OEM1

- (1) Turn off the external power and confirm the EXT LED is off.
- (2) Turn on the power.

3. Installing GT-540-OEM1 Utility

It needs the runtime environment with .NET Framework 2.0 or above to execute the GT-540-OEM1 Utility in the PC. If there has .NET Framework 2.0 or above in the PC, the section 3.1 can be omitted.

3.1 Installing .NET Compact Framework

- A. Download .NET Compact Framework 2.0 at the following URL: http://m2m.icpdas.com/download.html
- B. Execute setup file "dotnetfx20.exe"
- C. The install figure is as follows:
 - (1) Press "Next" to the next step.



(2) Select the "I accept the terms of the License Agreement" and "Install" to the next step.

| End-User Lic | ense Agreemen | nt | | | | ~ |
|--------------------------------|---|--------------|----------------|-----------------------------|-----------------|-------------|
| MICROSOFT S | | MENTAL LIC | ENSE TERMS | | | |
| MICROSOFT | NETTRAMEWORK | 2.0 | | | | |
| Microsoft Corp | oration (or based | on where yo | u live, one of | its affiliates) | licenses this | |
| soppiement to software (the | "software"), you n | nay use this | supplement, \ | riuows opera (ou may not | use it if you d | do |
| not have a lice | ense for the softwa | are. You ma | y use a copy c | f this supple | ment with ea | ch |
| validly licensei | d copy of the softw | vare. | | | | ~ |
| | 20 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - | | 20 - P | | | |
| | | | | | Prin | nt |
| ly clicking "La | cept the terms of | the License | Aareement" ar | nd proceedin | a to use the | |
| | | | | die all de | Cut | É L La seco |
| product, I indi | ate that I have re | ad, understo | ood, and agree | ea to the teri | ms or the End | 1-User |

(3) The installation process would be going

| Hicrosoft .NET Framework 2.0 Setup | |
|---|--------|
| Installing components | |
| | |
| The items you selected are being installed. | |
| | |
| Installation Progress: | |
| | |
| Generating script operations for action: | |
| Updating component registration | |
| | |
| | |
| | |
| | Cancel |

(4) After finishing the installation, press "Finish" to exit the program.

| 🛱 Microsoft .NET Framework 2.0 Setup | |
|---|--------|
| Setup Complete | |
| | |
| | |
| Microsoft .NET Framework 2.0 has been successfully installed. | |
| It is highly recommended that you download and install the latest service packs and security updates for this product. | |
| For more information, visit the following Web site: | |
| Product Support Center | |
| | |
| | |
| | |
| | |
| | |
| | |
| | Finish |

3.2 Installing GT-540-OEM1 Utility

- A. Execute "Install_GT540_OEM1_Utility.exe"
- B. The installation figure is as follows:
 - (1) Press "Next" to start the installation procedure.



(2) Select the installation path. The default path is "C:\Progrm Files\GT-540-OEM1 Utility". Press "Next" to the next step.



- (3) Input the name shown in "All Programs". Press "Next" to the next step.

(4) After finishing the installation procedure, press "OK" to the next step.





(5) Press "Finish" to finish the installation procedure.

(6) Launch GT-540-OEM1 Utility from the start menu "Start→All Programs→GT-540-OEM1 Utility→GT-540-OEM1 Utility".



4. GT-540-OEM1 Utility operation

Before GT-540-OEM1 utility is connected to the PC correctly, please confirm these following steps:

1. The STA LED is blanking. There are 2 kinds of blanking in GT-540-OEM1.

| STA LED | Description | |
|--------------------|---|--|
| Blanking per 1 sec | Normal mode | |
| Blanking per 50 ms | The pin code is wrong. The login windows would show | |
| | the field to input pin or PUK code | |

- 2. Confirm the RS232 connection between GT-540-OEM1 and PC is correct. Users can refer to the following figure.
- 3. During the setting procedure, the external power must be turn on.



4.1 Main menu



The main menu of GT-540-OEM1 Utility includes the following sections:

- A. Tool menu
 - (1) "COM": Set the COM port number in PC connecting to GT-540-OEM1.
 - (2) Login/Logout: Before operating GT-540-OEM1, users need to login to GT-540-OEM1 Utility. After login the system successfully, the menu item "login" would become "logout" and the GT-540-OEM1 Utility would be operated normally. Once the power is reset, the login procedure needs to do again.
 - (3) "Language"

GT-540-OEM1 Utility just supports English now, but it will support multi-language in the future.

(4) File

There are import and export functions in "File" item. The functions would be enabled when "Main parameters" window is open.

- Export: The function can export the parameters as .par file from the "Main parameters" windows.
- Import: The parameters would be shown in "Main parameters" window from the specific .par file.
- (5) Version: Including the firmware and Utility version information.

- (6) System: Provide users for recovering GT-540-OEM1 to factory ,resetting GT-540-OEM1 and debug mode.
- (7) Exit: To exit GT-540-OEM1 utility
- B. 5 function item :
 - "Main parameter": The main parameter setting of GT-540-OEM1 includes E-mail address, mail server, Modbus device, data log, scan time and comport setting.
 - (2) "Device time": Display and set the RTC time of GT-540-OEM1. It is also can get the information of the last and next time of the return report.
 - (3) "DO Control/DI statuses": Display the status of I/O and control the DO output.
 - (4) "Signal Quality": Show GSM signal strength in GT-540-OEM1
 - (5) Counter Value: Enable or disable counter function and show or set counter value.
- C. Status Line

Show the related information during the operation procedure including:

- (1) The com port number of PC
- (2) The communication setting of COM Port
- (3) The status of COM Port
- (4) The result of Utility operation

4.2 Login

It needs to login into GT-540-OEM1 to set its parameters. The description is below:

- (1) Select the COM port number of PC.
- (2) Press the "login" button
- (3) If you are the first time to login, please set the time of GT-540-OEM1.



If the pin code in GT-540-OEM1 is not correct, the STA led would be blanking per 50 ms and GT-540-OEM1 utility would ask for users to input Pin or PUK code.

(1) Asking for inputting PIN code:

If the PIN code is effective, the "Enter SIM PIN/SIM PUK" window would pop-up as follows. If the number of times for inputting the wrong PIN code is more than the allowed number, the PIN code would be ineffective. And the "PUK code" window would pop up.



(2) Asking for inputting PUK code

If the PIN code is ineffective, the "PUK code" window would pop-up as follows. As the number of times for inputting the wrong PUK code is more than allowed number, the SIM card would be ineffective forever. Therefore, it is important to input the correct PUK code.

| 🔜 Entry SIM PIN / SIM PUK | × |
|--|---|
| Times Remain to Input SIM PUK: 10 Please Input SIM PUK Code: | |
| Please Input New SIM PIN Code: | |
| ОК | |

If the PIN or PUK code is correct, the STA led would blank per second. Users can operate other function of GT-540-OEM1 in this utility.

4.3 Device Parameters

There are 2 pages in "Device parameter" window. They are "Scan Time/E-mail" and "Modbus Device" pages.

After configuring the 2 pages, press "Write to Device" button to save these settings to GT-540-OEM1. Then, reset GT-540-OEM1 to enable these settings.

The "Read Form Device" button can help users to read back these settings from GT-540-OEM1. In addition, these setting would be read from GT-540-OEM1 when the "Main Parameter" window pops up from the main menu.

4.3.1 Scan Time/E-mail

The following page is "Scan Time/E-mail". Users can refer the explanation below :

| GT534 Utility GT540.0EM1.UV1.1 | .0 2010/02/23 File • Version System • Exit | | |
|--|---|---|--|
| B Device Parameters | , | | × |
| Scan Time/E-mial Modbus Device Device Information : Machine ID: alung SIM Card Number: | IO Scan Time/Report Time IO Status Record Interval : 10 secord Report Interval : | Mal Server Authority : NONE Mail Server Domain Name : msa.hinet.net | Form Device Write to Device E-mail Subject Datalog Report Test E-mail address edit : Add Update Delete |
| GPRS Information : Access Point Name(APN) : internet User Name : guest Password : | min Report Base Time : : : : : : | Mail Server IP : Port : 25 Mail From(e-mail address) : annie.long@msa.hinet.net | E-mail address of the receiver : NO. Receiver Address 1 ahung_shih@icpcon.com |
| guest the AI signal scale : C Enable Scale Maximum: 10 Minimum: 0 Offset: 2 | Max size of one attached file : 600 KBytes Max size of one e-mail file : 1200 KBytes | User Name : Password : Primary DNS : 168.95.1.1 Secondary DNS : | |
| COM5 9600,n, 8,1 COM Port Connected | Read all parameters successfully!! | | |

1. Device Information

| Textbox name | describe | |
|---------------------|---|--|
| Machine ID | The device ID would be shown in the report. It can | |
| | be used for recognizing the GT-540-OEM1. The | |
| | length of characters is 20 without supporting Unicode | |
| | and ";" characteristic. | |
| SIM Card Number | This text field can show or input the phone number | |
| | of the plug-in SIM card. Take Taiwan for example: | |
| | 0928xxxxxx. | |
| 2. GPRS Information | | |

Textbox name describe

| Access Point Name | Access point name (APN) is the name used to | |
|------------------------|---|--|
| | identify a general packet radio service (GPRS) bearer | |
| | service in the GSM mobile network. The APN | |
| | defines the type of service that is provided in the | |
| | packet data connection. You can get this APN by ISP. | |
| User name | After the ISP registration, ISP will give you user | |
| | name, and you can use GPRS by the user name. | |
| Password | After the ISP registration, ISP will give you | |
| | password, and you can use GPRS by the | |
| | password. | |
| 2 The AL signal cooler | | |

3. The AI signal scale:

| Textbox name | Describe | |
|--------------|---|--|
| Maximum | If "Enable Scale" is checked ,the AI signal using | |
| | three new fields that will be introduced by the | |
| Minimum | user .These values must be used in the following | |
| | formula:(max-min)/16*(AI-4) + min + offset | |
| Offset | and the result must be added in the attached file | |
| | used in the e-mail. | |

4. IO Scan Time/Report Time

| Textbox name | describe | |
|------------------|---|--|
| IO Status Record | The GT-540-OEM1 can log IO status including | |
| Interval | Modbus RTU I/O in the micro SD. The value can set | |
| | record time interval(unit: sec) | |
| Report Interval | Set report time interval. The GT-540-OEM1 calculate | |
| | time interval according to report base time.(unit: | |
| | min) | |
| Report Base Time | The GT-540-OEM1 calculate time interval according | |
| | to report base time. (Unit: min), for example, if | |
| | report base time set 8:30and report interval set 60 | |
| | min, it will report data log at 9:30 from e-mail. | |

5. File Size

| Textbox name | describe | |
|-----------------|--|--|
| Max size of one | Max size of each attached file for e-mail and data | |
| attached file | log. If data is more than max size of one attached file, | |
| | it will create new file to record data. | |
| Max size of one | Max size of one E-mail file, this value must more | |
| E-mail file | than max size of one attached file, Some mail server | |

| limit one of the e-mail size. | |
|-------------------------------|--|
| | |

6. Mail Server

| Textbox name | Describe |
|------------------|--|
| Authority | NONE or AUTHORITY |
| Mail Server | Send mail server Domain name, if Domain and IP is |
| Domain name | setting, IP setting is primary. |
| Mail Server IP | IP of mail server |
| Port | TCP port of mail server for send e-mail |
| Mail From(E-mail | If the e-mail can't send to user, it will return error |
| address) | message and e-mail to this e- |
| User name | User can register user name from mail server |
| Password | User can get password to match username from mail |
| | server |
| Primary DNS | The Domain Name System (DNS) is a hierarchical |
| | naming system for computers, services, or any |
| | resource connected to the Internet or a private |
| | network. You must give this value which is DNS |
| | server IP if you want to connect mail server by |
| | domain name. |
| Secondary DNS | Backup DNS server |

7. E-mail subject

| Textbox name | Describe |
|----------------|---|
| E-mail Subject | The User can change the e-mail subject from the |
| | field. |

| Name | describe | |
|-------------------|--|--|
| Add | User can add e-mail address of the receiver by this | |
| | bottom. | |
| | The maximum of the E-mail address is 10. | |
| Update | User can renew e-mail address of the receiver by this | |
| | bottom | |
| | 1. Select the receiver in the table | |
| | 2. Renew E-mail on "E-mail address of the receiver" | |
| | textbox | |
| | 3. Chick update bottom. | |
| Delete | User can delete e-mail address of the receiver by this | |
| | bottom | |
| | 1. Select the receiver in the table. | |
| | 2. Chick delete bottom. | |
| E-mail address of | You can add, delete or update form this textbox. | |
| the receiver | | |
| table | Receiver list. | |

8. E-mail Address edit

4.3.2 Modbus Device

Another page in "Device parameter" is about Modbus device setting. The explanation is below:

| 🚰 GT534 Utility GT540.0E | MI.UVI.1.0 2010/02/ | 23 | | | | | | |
|-----------------------------|--------------------------|---------------------|--------------------------|----------------------------|----------------------|-----------|----------------------------|------------------------|
| COM5 - Logout Lan | guage • File • Ve | rsion System | Exit | | | | | |
| 🐼 Device Parameters | | | | | | | | X |
| Scan Time/E-mial Modbu | as Device | | | | 🛆 Re | ad Form D | evice 😾 W | rite to Device |
| Edit : (only support ICP | DAS modbus devic | e) | | | | Comma | nd 1 | |
| Baud Rate : 9600 | * | | | | | | | |
| Device Name : | * | | D | evice Addr. : | | | Add | |
| Type Channels | Start Addr. | Dataforr | nat | Type co | le | | | |
| DI | | х | | х | | | | |
| | | | | | | | Update | |
| DO | | | | X | | | | |
| AI | | | × | | ~ | | T. I. | |
| AO | | | ¥ | | ~ | | Delete | |
| NO New Day 4 | 44. 19 4.44. | 00 444 | A1 A44 | Format | Toma | | de Romai | Terre |
| 1 Customl 5 | 0 | 0 | 8 0 | 64 bits int | Unknown | 0 | or. Pornas | rype |
| 2 Custom2 10 3 M-7016 12 | 0 | 0 4 32 | 8 0 | 32 bits int Engineering | Unknown (001-/+15 | 8 0 | 32 bits int Engineering | Unknown [50] 0/10 V |
| | | | | rugarrang | [00] | | Lingariting | (0) 010 1 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| COM5 9600,n,8,1 COM Port | Connected Read all paran | neters successfully | 11 | | | | | |

The GT-540-OEM1 supports Modbus RTU. If users add, update, or delete device by utility.

| Function | Describe |
|---------------|--|
| Baud rate | Baud rate of device, The GT-540-OEM1 supports baud rate detection: |
| | 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200. |
| Device name | You can select Modbus RTU device (Only ICP DAS products). |
| | The maximum of the Modbus devices is 3. |
| Device addr | 1-247, Modbus address according to Modbus device |
| Channels | Channel number |
| Start address | Start address of IO in the Modbus device. The details please refer |
| | Modbus device manual |
| Data format | 2's comp HEX/Engineering unit |
| Type code | Please refer Modbus device configuration |
| Add | User can add Modbus device by this bottom. |
| | The maximum of the Modbus devices is 3.hy6 |
| Update | User can renew configuration of the Modbus device by this bottom |
| | 1. Select the Modbus device in the table |
| | 2. Renew configuration |
| | 3. Chick update bottom. |
| Delete | User can delete configuration of the Modbus device by this bottom |
| | 1. Select the receiver in the table. |
| | 2. Chick delete bottom. |

4.3.3 Add new Modbus Device

If device name doesn't exist in the Device Name list, Users can add new device on the following step and figures.

1. Select Custom in the Device Name list box

| 🚰 G T 534 U | ility G1 | 1540.OEMI | .071.1.0 | 2010/02 | 123 | | | | | | | | | | 30 |
|-------------------|--------------------|------------|------------|---------|---------|---------|---------|----|----------------------------|-----------------|---------|---------|--------|-------------|------|
| COM5 | - Logo | ut Langua | age • F | ile • V | ersion | System | · · Es | at | | | - | - | | | 6 |
| Scan Time | /E-mial | Modbus I | Device | | | | | | | R | ead Fo | rm Devi | ce 🔽 1 | Write to De | vice |
| -Edit: (o Baud | nly supp Rate : | ort ICP Da | AS mod | v devia | e) | | | | | | C | mmand | : | | |
| Device 1 | Name : | Custom | | v <0 | = Input | Device | Name | | Device Addr. | 4 | | | Add | | |
| Туре | Chann | els | Start Ad | dr. | | Datafor | mat | | Туре с | ode | | | | | |
| DI | 0 | | 0 | | | х | | | х | | | | Update | |] |
| DO | 0 | | 0 | | | х | | | х | | | | | | |
| AI | 0 | | 0 | | 16 b | its int | | * | Unknown | ~ | | | Delete | | ן |
| AO | 0 | | 0 | | 16 b | its int | | ~ | Unknown | * | | | | | |
| NO. Nat 1 Cus | me toml | Dev. Add | r. DI O | Addr. | DO 0 | Addr. | AI 8 | A. | ldr. Format 64 bits int | Type Unknown | 0A 0 | Addr. | Format | Туре | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
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2. Rename "Custom"

| g 1534 u l COM5 | ility GT | 540.0EMI. | 171.1.0 te • Fil | 2010/02 | 23 trsion | System | • E: | cit | | | | | | | | |
|---------------------------|---------------------|--------------------|----------------------------|--|--------------|------------|------|-----|------|-------------|---------|--------|---------|---------|-------------|-------|
| 🔂 Device P | arameters | | | | | | | | | | | | | | | E |
| Scan Time | /E-mial | Modbus D | vice | | | | | | | | R | ead Fo | rm Devi | ce 🔽 1 | Vrite to De | evice |
| Edit : (o Baud | nly suppo Rate : | ort ICP DA 9600 | S modb | v devic | e) | | | | | | | Co | mmand | : | | _ |
| Device 1 | Vame : | ICP DAS | | v <g< td=""><td>= Input</td><td>Device</td><td>Name</td><td></td><td>De</td><td>vice Addr.</td><td>4</td><td></td><td></td><td>Add</td><td></td><td></td></g<> | = Input | Device | Name | | De | vice Addr. | 4 | | | Add | | |
| Туре | Chann | els S | tart Add | r. | | Datafon | mat | | | Туре со | de | | | | | |
| DI | 0 | |) | | | х | | | | х | | | | Up-date | | ٦ |
| DO | 0 | 0 | 1 | | | х | | | | х | | | | | | |
| AI | 0 | | 1 | | 16 bi | ts int | | ۷ | Ur | iknown | ~ | | | Delete | | ר |
| AO | 0 | | 1 | | 16 bi | ts int | | ۷ | Ur | iknown | * | | | Delete | | |
| NO. Na | me | Dev. Addr. | DI | Addr. | DO | Addr. | AI | A | ddr. | Format | Туре | A0 | Addr. | Format | Туре | |
| I Cus | tomi | , | 0 | | 0 | | \$ | 0 | | 64 bits int | Unanown | 0 | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| < | | | | | | | | | | | | | | | | 2 |
| COM5 9600 | (n,8,1 🔘 | M Port Conne | cted Res | d all para | neters st | corssfully | rll | - | _ | _ | | | | | | |

3. Set Device Address, DI/DO/AI/AO channels, start address, and date format.

The GT-540 just supports HEX value for AI/AO. The 16-bit data format can support to the maximum number of channel is 32. The 32-bit data format can support to the maximum number of channel is 16. The 64-bit data format can support to the maximum number of channel is 8.

| Device P | arameters | -00- | | .131011 | cyncia | | | | | | | | | |
|-------------------|--------------------------------|-----------|-----------|---------|----------|---------|----|--------------|------|---------|---------|-------------|------------|---|
| can Time | /E-mial Modb | us Device | | | | | | | R | ead Fo | rm Devi | ce 🔽 1 | Write to D | e |
| Edit : (o Baud | nly support ICI Rate : 9600 | PDAS mod | ous devic | e) | | | | | | Co | mmand | : | | |
| Device 1 | Jame : ICP I | DAS | v <6 | = Input | Device | Name | | Device Addr. | 4 | | | Add | | |
| Туре | Channels | Start Ad | dr. | | Datafori | mat | | Туре со | de | | | | | 1 |
| DI | 1 | 0 | | | х | | | х | | | | Update | | Ì |
| DO | 3 | 0 | | | х | | | х | | | | · p · · · · | | |
| AI | 2 | 0 | | 16 bi | ts int | | ~ | Unknown | ¥ | | | | | |
| AO | 1 | 0 | | 32 bi | ts int | | ~ | Unknown | * | | | Delete | | _ |
| IO. Nat | ne Dev. | Addr. DI | A.ddr. | DO | Addr. | AI 8 | Ad | ldr. Format | Type | AO 0 | Addr. | Format | Type | Ì |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

4. Click "Add" button

| G1534 COM5 | Utility GI | 1540.0EMI ut Langua | .071.1.0 ge • F | 2010/02 | 23 rsion | System | • E | rit | | | | | | | |
|----------------------|--------------------------|------------------------|--------------------|---------------|-------------|-----------|---------|-----|-------|-----------------------|-----------------|---------|---------|-------------|------------------|
| Device | Parameters | | or - | | | | | | | | | | | | <mark>8</mark> ^ |
| Scan Tin | ne/E-mial | Modbus I | evice | | | | | | | | Re Re | ad Fo | rm Devi | ce 🔽 W | rite to Device |
| Edit : Bau | (only supp- ud Rate : | ort ICP DJ 9600 | LS mod | v devic | e) | | | | | | | | mmand | : | |
| Device | e Name : | ICP DAS | | v << | Input | Device | Name | | De | vice Addr. | 4 | | | Add | |
| Туре | Chann | els : | Start Ad | dr. | 1 | Datafori | mat | | | Type co | de | | | | |
| DI | 1 | | 0 | | | х | | | | х | | | | Update | |
| DO | 3 | | 0 | | _ | х | | _ | _ | х | | | | | |
| AI | 2 | | 0 | | 16 bi | ts int | | ۷ | Un | known | ~ | | | Delete | |
| AO | 1 | | 0 | | 32 bi | ts int | | ~ | Un | iknown | * | | | | |
| NO. N | Name Sustom1 | Dev. Adde | DI | Addr. | DO 0 | Addr. | AI 8 | A 0 | fide. | Format 64 bits int | Type Unknown | AO 0 | Addr. | Format | Туре |
| 2 IC | CP DAS | 4 | 1 | 0 | 3 | 0 | 2 | 0 | | 16 bits int | Unknown | 1 | 0 | 32 bits int | Unknown |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |
| < | | | | | | | | | | | | | | | |
| COM5 196 | 500,n,8,1 🗖 | M Port Conn | acted R | rad all paras | netens su | constally | di | | _ | | | | | | |

4.3.4 Import/Export Parameters

Users can use the import and export functions from the menu bar. This function would be enabled when the "Device Parameter" window is open. The explanation is below:

| S GT534 Utility GT540.0EM.UY1.0.0 2009/09/15 | | | | | | | | | |
|--|-------------------------------|------------------------------|------|--|--|--|--|--|--|
| | COM1 - Logout Language | File - Version System - Exit | | | | | | | |
| ſ | 🐻 Device Parameters | Import Parameters | | | | | | | |
| | Scan Time/E-mial Modbus Devic | e Read Form Device | vice | | | | | | |

A. Import Parameters : This function is used for reading back the setting of device parameters from .par file and displaying in "Device parameter" window. When press "import" button, a file selection window would pop up for users to choice

| Import Settin | B | | | | | ? 🔀 |
|------------------------|--------------------------|-----------------------|---|----|-------|--------|
| Look ir | n: 🔁 GT-540 Ut | ility | ~ | 00 | 🕫 🛄 • | |
| My Recent Documents | Carlor CH5 Carlor CHT | | | | | |
| My Documents | | | | | | |
| My Computer | | | | | 1000 | |
| | File name: | | | | ~ | Open |
| My Network | Files of type: | Paramater file(*.par) | | | * | Cancel |

B. Export Parameters: The function is used for saving the setting of "Device parameter" window as .par file. When press "Export" button, a file selection window would pop-up for users to save the setting as .par file in specific path.

| Export Setting | | | | | | | | | ? |
|------------------------|----------------|----------|-------------|-----------|---|---|-----|---|--------|
| Save in: | 🚞 GT-540 Utili | ly . | | ~ | 0 | 1 | P 🖽 | • | |
| My Recent Documents | CHS 2h-CHS | | | | | | | | |
| My Documents | | | | | | | | | |
| My Computer | | | | | | | | | |
| | File name: | | | | | | ~ | | Save |
| My Network | Save as type: | Operatin | g Record Fi | le(*.csv) | | | ~ | | Cancel |

4.4 Device Time

the

This window provides the function to inquire and modify the time of GT-540-OEM1. Besides, the next and last report times are also shown. The text field operation is below.

| Device Time / Report Info | Command | |
|--------------------------------------|---------|------------|
| Device Time : 2009/10/14 19:16:21 | Set | Set as Now |
| Next Report Time: | | |
| Last Report Time : | R | lead |

Text field :

- (1) Device time: show the time of GT-540-OEM1. Users also can change the time in this field to key in the specific time.
- (2) Next Report Time : show the next report time
- (3) Last report time : show the last report time

Operation:

- (1) "Set as Now": Set the PC time to GT-540-OEM1. After setting the time successfully, the information of GT-540-OEM1 time and report time would be updated.
- (2) Set: Set the GT-540-OEM1 time according the "Device Time" field. After setting the time successfully, the information of GT-540-OEM1 time and report time would be updated.
- (3) Read: Read back the time of GT-540-OEM1, the next report time and the last report time.

4.5 Counter Value

The window provides the function to enable or disable function and inquire or modify the counter values of DI0 \sim DI5. The explanation of operation and text field is below:

| 🔤 Counters ۷ | alue | | × |
|--------------|----------------|------------|-----------|
| Name | Enable Counter | Value | Set Value |
| DI 0 | V | 000000119 | 119 |
| DI 1 | V | 00000230 | 230 |
| DI 2 | | 000000000 | 0 |
| DI 3 | | 000000000 | 0 |
| DI 4 | | 0000000000 | 0 |
| DI 5 | | 000000000 | 0 |
| | Read | Set Set | |

Text field :

- 1. Name: The DI name of DI0 ~ DI5 $\,\circ\,$
- 2. Enable Counter: DI Counter enables or disable.
- 3. Value : The current counter value (maximum: 999999999)
- 4. Set Value: Input the defined counter value. The maximum is 9999999999. This field is enabled when DI is set as counter mode.

Operation:

- 1. Read: Read the current counter value from GT-540. If the "Enable Counter" is not checked, the counter value is 0.
- 2. Set: Change the counter value into GT-540 according to the "Set Value"

Datalog file format :

- 1. If the DI counter function is enabled, the title will show "CIx"(x: channel number) in .csv file, and the content is counter value.
- 2. If the DI counter function is disabled, the title will show "DIx"(x: channel number) in .csv file, and the content is signal value(0 or 1).

The sample:

| А | B | С | D | E | F | G | Н | I | J |
|-----------------|-------|-------|-----|-----|-----|-----|-----|-----|--------|
| Date | CI0 | CI1 | di2 | DI3 | di4 | DI5 | do0 | D01 | AI0 |
| 20100223 175626 | 11111 | 22222 | 0 | 0 | 0 | 0 | 0 | 0 | -0.494 |
| 20100223 175636 | 11111 | 22222 | 0 | 0 | 0 | 0 | 0 | 0 | -0.497 |
| 20100223 175704 | 11111 | 22222 | 0 | 0 | 0 | 0 | 0 | 0 | -0.494 |
| 20100223 175714 | 11111 | 22222 | 0 | 0 | 0 | 0 | 0 | 0 | -0.494 |

4.6 DO control/DI status

The function is used for controlling DO and reading the status of DIs:



Text field

(1) DI0 ~ DI6 \ DO0 ~ DO1 :

 \diamond Grey : The voltage logic is high.

 \diamond Red : the voltage logic is low

Operation

- (1) Read : Read back the status of DI0 ~ DI6 and DO0 ~ DO1 from GT-540-OEM1.
- (2) $DO0 \sim DO1 ON$: Set the DO output on
- (3) DO0 ~ DO1 OFF : Set the DO output off

4.7 Signal Quality

| 🛃 Signal Quality | | × |
|------------------|------|---|
| | 65% | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | Read | |
| L | | |

This window can show GSM signal strength.

Text field :

The strength is divided into 5 sections shown in percentage. Operation :

(1) Read : Read the GSM signal strength.

4.8 Version

Press "Version" in tool menu, and the window would show the version of Utility and firmware.

| 🚺 Version Information | × |
|------------------------------|-----|
| | _ |
| Firmware Version : | |
| | |
| GT540FV1.0.0OEM 2009/09/22 | |
| | |
| Utility Version : | |
| | - 1 |
| GT540.OEM.UV1.0.0 2009/09/15 | |
| | |
| | |
| | |
| Kead | |
| | |
| | |

Text field:

(1) Firmware version: show the version information of GT-540-OEM1's firmware

(2) Utility version: show the version information of GT-540-OEM1's utility Operation:

Read: Read this information from GT-540-OEM1.

4.9 System

"System" menu item has 3 functions of recovering factory setting and resetting GT-540-OEM1

| 🥵 GT534 Uhility GT540.0EM.UV1.0.0 2009/09/15 | | | | | | | |
|--|--|--|--|--|--|--|--|
| COM1 - Logout Language - File - Version | System - Exit | | | | | | |
| | Recover to Factory Settings Reset GT-540 Debug | | | | | | |

4.9.1 Recover to Factory Settings

The function is used to recover GT-540-OEM1 as factory settings including password. The steps are below:

(1) Make sure the STA led is blanking per 1 sec.

(2) Select the Recover to Factory Settings.



4.9.2 Reset GT-540-OEM1

The function is used to reset GT-540-OEM1 by software.

- (1) Make sure STA led is blanking per 1 second
- (2) Select "Rest GT-540-OEM1" button to reset GT-540-OEM1.

4.9.3 Debug Window

| 🌇 GT534 Utility GT540.0EM.UV1.0.0 2009/09/15 | | |
|--|-----------------------------|--|
| COM1 - Logout Language - File - Version | System - Exit | |
| | Recover to Factory Settings | |
| | Reset GT-540 | |
| | Debug | |
| | | |
| | | |
| Sec. Sec. | | |

The function is used to test E-mail and save setting log. The steps are below:

| S GT534 Utility GT540.0EM.UY1.0.0 2009/09/15 | |
|---|---------|
| COM1 • Logout Language • File • Version System • Exit | |
| 🔚 Debng | |
| Command: Mail Test Monitor Save Message | Clear |
| | |
| DI Status | Quality |
| L/I Status | Quanty |

Debug mode has 4 Items of Mail test, Monitor, save message, and clear.

- 1. Mail test: Users can send e-mail form utility by the GT-540, and users can see the log of process.
- 2. Monitor: Users can see all command and response, and users can save the log of process.
- 3. Save message: save command and response log(*.txt)
- 4. Clear: clear message

5. Firmware Update

5.1 Hardware and software

5.1.1 Hardware



5.1.2 Software

- 1. Download tool : ISP_Firmware_en.exe
- 2. Firmware file(*.fw)

5.2 Update Process

- 1. GT-540-OEM1 power input pin connect to DC power supply
- 2. Connect download cable with GT-540-OEM1 J2 and PC COM port



- 3. Turn on the DC power
- 4. Rrun ISP_Firmware_en.exe in PC
- 5. Select serial port
- 6. Click "Browser", and select file to update (*.fw)
- 7. Click "Firmware Update", and wait to update
- 8. after success ,click "Exit" to exit

| 👎 Firmware Update Program 🛛 🔀 | | |
|---|---|-----------------------|
| COM Port COM4 | | 1. Select serial port |
| Firmware File : D\Work\GT-534\Firmware-new\SMS\bin\Firmware.fw Browser | ┝ | 2. Select file |
| Firmware Update State => Firmware Update Success ! | ┝ | 3. Update information |
| | | |
| Firmware Update | ┝ | 4. Start update |
| Exit | | |

6. Data log and upload

The GPRS maybe happen disconnect during transmission, and the GT-540-OEM1 support data log and data upload for complete data. This chapter will introduce process and format for data log.

P.S It doesn't support SSL/TLS encryption.

6.1 Data format

The file format is "*.csv" that divided each record with ",".In each file, the title is name of record, and according to the order are date, The GT-540-OEM1 IO data, and Modbus device data.

Example: 2009/09/24 17:55:18 Local DI0~DI1: Counter mode (title CI) Local DI2~DI5: DI mode (title DI) Modbus device M-7016 Address: 5 DI*1, DO*4, AI*2, AO*1 Record data:

| Date | CI0 | CI1 | DI2 | DI3 | DI4 | DI5 | DO0 | DO1 | AI0 | Module [M-7016] Addr. | DI0 | DO0 | DO1 | DO2 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|--------|-----------------------|-----|-----|-----|-----|
| 20090924 175518 | 119 | 230 | 0 | 0 | 0 | 0 | 0 | 0 | -0.492 | 5 | 1 | 1 | 1 | 1 |
| 20090924 175519 | 119 | 230 | 0 | 0 | 0 | 0 | 0 | 0 | -0.493 | 5 | 1 | 1 | 1 | 1 |

| DO3 | AI0 | AI1 | AO0 |
|-----|-------|-------|-----|
| 1 | 0.001 | 0.002 | 6.8 |
| 1 | 0.001 | 0.003 | 6.8 |

6.2 Process of Upload E-Mail

Please refer flow chart below.



The system would create record file by date of now and scan time that user can

differentiate variety of data. The GT-540 records data continuously when it uploads data. Example:

Date: 2009/09/28 06:30 PM , scan time : 1

The file name is "20090910_1830_1.csv".

The new file will be created when the event is on condition below.

- 1. Users add, update, delete Modbus device
- 2. The size of file is over the setting
- 3. Upload report time
- 4. Update scan time

7. Troubleshooting

| Item | Trouble state | Solution |
|------|---|--|
| 1 | EXT LED is off | Please check the external power and wire connection. |
| 2 | STA is always on | Check SIM card Check Antenna Check the GSM signal strength |
| 3 | GT-540-OEM1 Utility can't connect to GT-540-OEM1 | Check STA LED blinking every 1 sec Check com port connection and baud rate setting |
| 4 | STA led is blanking per 50 ms | The pin code is wrong. The login windows would show the field to input PIN or PUK code |