Delta Plus MOBILE II
GSM/SMS/GPRS Class 10 with TCP/IP stack modem
Part No: ASLH306

User Guide

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Delta Plus MOBILE II GSM/SMS/GPRS Class 10 with TCP/IP stack modem
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Guide to the manual

This manual contains detailed technical information about the Delta Plus MOBILE II GSM/SMS/GPRS modem, including the commands necessary to configure and use it in your particular application. If you require further technical detail on this modem, please call our Technical Support Group.

Disclaimer

This manual has been checked for accuracy. The information included in this document is pertinent to all versions of the Delta Plus MOBILE II GSM/SMS/GPRS modem at the time of publication. Subsequent products and manuals are subject to change without prior notification. Therefore ASLH Ltd. will take no responsibility for damages incurred, either directly or indirectly, from errors, omissions or inaccuracies between the product and the manual.

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Introduction

Thank you for purchasing this ASLH Ltd modem, which is guaranteed for one year from the date of purchase. If, after reading this manual, you have any problems or queries regarding this modem, please contact ASLH Ltd. from whom the modem was purchased. In the unlikely event of you needing to return the modem to us, you must first call our Returns Department, to obtain a Return Authorisation Number (RAN).
This number must be clearly marked on the outer packaging containing the faulty modem, and addressed for the attention of the Returns Department. No goods will be accepted without a Return Authorisation Number. Please enclose a copy of your original purchase invoice, to enable us to determine the warranty status. If no fault is found, a charge will be made to cover the costs of testing and carriage. Your original or replacement modem will be returned with an engineering report on the fault found. Thank you for your co-operation.

The Delta Plus MOBILE II is a new low powered high speed GSM/SMS/GPRS modem which has been specifically designed to meet the requirements of the telemetry market and specifically applications within the Automatic Meter Reading (AMR) arena.

The purpose of this manual is to enable the user to set up, configure and use the modem in a manner suitable for any given application. A basic level of modems and data communication technology is assumed.

Features

DTE speeds up to 9600 bps
Bearer channel speeds of 9600 bps, 4800 bps, 2400 bps and 1200 bps.
Supports auto-dial and auto-answer on number of rings
NVRAM stores configuration parameters
Suitable for approvals/use in most countries
Interface is a 25 pin D-type RS232 Connector
Power supply input on pins 9/15 7gnd of 25-way “D” type connector
Auto Shutdown minimises RS-232 Power consumption during periods of inactivity.
Environment – Temperature : 0-50°C Humidity : 95% n on condensing
Enhanced AT command set.
Integrated call progress and dialling.
Advanced power supply handling techniques.
Remote access capability.
Dual Band - ie. E-GSM (900 Mhz) or GSM (1800 Mhz)
GPRS – Mobile Originate and Listen modes. (Class 10)
Internal battery option.
External power option

Connecting to your Terminal or Computer

The 25 way D-type connector on the top of the modem provides the relevant input and output connections to asynchronous (Serial RS-232 and compatible) controllers. To establish a connection the modem can be directly connected to a suitable 25 way socket on your computer or other DTE device, or a short RS-232 cable can be used. When connecting the modem to the DTE device, consideration must be given to the
power supply arrangements as most devices will not provide a suitable supply to the modem via the 25 way D-type connector.
The 25 way D-type connector is wired as follows:

Pin number, name and mnemonic:

2 Transmit Data    TxD
3 Receive Data     RxD
4 Request to Send    RTS
5 Clear to Send     CTS
6 Data Set Ready    DSR
7 Signal Ground/Supply Ground  SG
8 Data Carrier Detect   DCD
9 Power In      PI
15 Power In     PI
20 Data Terminal Ready   DTR
22 Ring Indicator    RI

Supplying power to the modem

The Delta Plus MOBILE II GSM/SMS/GPRS modem is powered via the RS232 interface connector. Pins 9 and/or 15 require a +7 to +24 Volts DC supply. [Earlier issues of the ASLH306 required +7 to +15Volts]. The modem consumes approximately 1 Watt. The supply to the modem is floated across an internal SuperCapacitor. These devices hold a considerable charge and will allow the modem to continue to function for several minutes after the removal of the power supply. This enables the modem to be used in environments where the power supply is either intermittent and/or inadequate (within reason) for a conventional modem product.

Battery powered version.

The GSM/SMS/GPRS modem is also available as a battery powered device. The battery employed in the modem is a Lithium Ion Polymer type and is subject to a minimum duty cycle of 1000 operations.

The battery is fitted in addition to the “Super Cap” that is present in the standard modem and will power the modem for approximately two minutes after the external supply has been removed. This is regardless of whether or not the modem is on line. When the modem shuts down it will issue a “Goodbye” message to the interface.

Additionally the modem can be switched off using an AT command. The AT+K command will shutdown the entire modem within 15 seconds. If the power supply to the modem is not removed within 30 seconds of the modem issuing the “Goodbye” message then it will commence its power up sequence and restart.

The battery powered modem will power up within 5 seconds after the external supply is applied given that the battery and capacitors are fully charged and that the modem is operating at room temperature. If the battery and capacitors are not fully
charged and/or the modem is not operating at room temperature then the power up sequence will take longer.

**Subscriber Identity Module card.**

This product requires a suitable Subscriber Identity Module (SIM) card inserted in the right hand side of the modem. The SIM card is provided by the network service provider eg. O2, Vodafone, Orange, T Mobile etc. This card must be data enabled, ie. a voice only SIM will not work. Additionally, if the product is to be used for GPRS applications then the SIM card must be GPRS enabled. This mode will be set as either mobile originate or terminate (IP listen) depending upon the users requirements. ASLH Ltd. is able to provide network service supplied by the aforementioned companies.

**SIM card insertion / orientation**  -  See Appendix 1

**Antennae.**

The Delta Plus MOBILE II GSM/SMS/GPRS modem is designed to work with many industry standard antennae. Connection to the antenna is via a flying lead terminated with a SMA type female co-axial connector. The selection of the most suitable antenna in any given installation will be dependent upon factors such as the distance from the cell site, signal strength, power supply levels, and other physical constraints. ASLH Ltd. will be pleased to assist customers with the selection of suitable antennae.

**Configuring the modem**

This is achieved by the use of the standard Hayes(™) AT command set as utilised in conventional land line modems. A comprehensive list of AT commands used by the Delta Plus MOBILE II GSM/SMS/GPRS modem follows.

**AT Command set**

AT+ commands should be used alone, not concatenated ie AT+Y<cr> not AT+Y0=1<cr> etc).
AT A

Answer mode enable

Causes the modem to answer an incoming call.

AT D       Dial Command

Causes the modem to go on line and dial the following telephone number subject to parameters set in the dial string.

eg: ATDT 12345 123456^m

Where “D” = Dial, “T” = Tone (Compatibility only), ^m = Carriage return.

AT E       Local Echo in command mode.

AT E0 = Local Echo off
AT E1 = Local Echo on

AT H       Hang Up command.

This command causes the modem to disconnect from the telephone line.

AT I       Module identifier command.

ATI 3 displays: Telit

ATI 5 displays: GE864-PY

AT O       Return to on line state command

This command returns to modem to the on line data transmission state following an on line command mode session. ie. it is used to return to data mode after the +++ escape sequence has been entered.

AT Q       Quiet mode. Defines whether or not messages generated by the modem are sent to the DTE.

AT Q0 = Quiet mode off
AT Q1 = Quiet mode on

AT V       Verbose mode enable. Defines whether the above messages are displayed as readable text or numeric values.

AT V0 = Verbose mode disabled
AT V1 = Verbose mode enabled
AT \text{X} \quad \text{Result codes. These are the messages generated by the modem when connection or disconnection is attempted.}

ATX0 Selects the Basic code set
ATX1 - Selects the extended result code set.
ATX2,3,4 - Same as ATX1.

AT \text{Z} \quad \text{Modem Reset}
Resets the modem without changing any parameters

AT &C \quad \text{Carrier control. This parameter defines the operation of pin 8 (DCD) of the RS 232C interface.}

AT &C0 = Always on
AT &C1 = Fixed to this setting – Carrier goes high when on line.
AT &C2 = Off in command mode – On when modem on line

AT &D \quad \text{Data Terminal Ready options}
This command controls the handling of the DTR line. (Pin 20).

AT&D0 - DTR state is ignored and no action is taken. This is the equivalent of holding DTR permanently active (high).

AT&D1 - Returns the modem to command mode on loss of DTR. This is the same as issuing the +++ escape sequence, i.e. the modem will go into command mode, but will not drop the line.

AT&D2 - Prevents the modem from originating or answering a call unless DTR is raised by the DTE, and if the modem is online when DTR drops, the call will be disconnected.

AT &F \quad \text{Restore Factory Configuration}
Configures the modem to factory default settings
(Does not default AT+ autosave commands).

AT&V \quad \text{This command shows the general set up of the modem.}
Displays, for example

DTE SPEED : AUTO
DTE FORMAT : AUTO
GSM DATA MODE : Not Transparent
AUTOBAUD                        : +IPR0=YES
COMMAND ECHO                   : E1=YES
RESULT MESSAGES                : Q0=YES
VERBOSE MESSAGES               : V1=YES
EXTENDED MESSAGES              : X1=YES
LINE SPEED                     : F0=autodetect
CONSTANT DTE SPEED             : YES
FLOW CONTROL OPTIONS          : &K3=HW bidirect.
ERROR CORRECTION MODE          : RLP
CTS (C106) OPTIONS             : &B2=OFF while disc.
DSR (C107) OPTIONS             : &S3=PHONE ready->ON
DTR (C108) OPTIONS             : &D0=ignored
DCD (C109) OPTIONS             : &C1=follows carrier
RI (C125) OPTIONS              : \R1=OFF dur. off-hk
C108/1 OPERATION               : &D4=NO
POWER SAVING ON DTR            : +CFUN:1=NO
DEFAULT PROFILE                : &Y0=user profile 1

OK

AT&W  Write configuration to non-volatile RAM.
N.B. – AT+ commands are autosave and therefore execution of this command is not necessary to save these to memory.

A/  Re-execute last command.

+++ -  TIES (Time Independent Escape Sequence)
When issued to the modem in an “on line” state this command will place the modem into “on line” command mode.

~~~~~~  Remote Access command.
When this command is issued from a remotely connected modem it will enable the remote user to interrogate and configure the ASLH306 device. For more information on this feature please contact ASLH for advice.

AT+Gn
AT+G0 - Sets to CSD mode.
AT+G3 - turns on 8N1 GPRS Mode
AT+G4 - turns on 7E1 GPRS Mode
(Autosave)

AT+I Reports ASLH 306 type, firmware version number, local settings
306 GE864 v3.22c A1 +6 G0/0 P1 J0
64108021050 10000000000-0001ABCD

AT+R Resets modem and causes the modem to execute a 10 second power cycle.

AT+S Displays Signal Strength, toggles on / off (default off).
Remote AT+S Reports last known Signal Strength.

AT+n Set baud rate / parity.
This is automatically saved, Note, when set to no parity, the gsm module will still respond to AT commands with even parity.

AT+0 9600 N81
AT+1 9600 E71
AT+2 4800 N81
AT+3 4800 E71
AT+4 2400 N81
AT+5 2400 E71
AT+6 1200 N81
AT+7 1200 E71
(Autosave)

AT+CBST?

This command gives information regarding the cellular network bearer channel.
Response: 0,0,1 (Autobaud rate, Asynchronous, Non transparent).

To change CBST for use when making outgoing calls
AT+CBST=n,0,1
n= 0 - autobauding (automatic selection of the speed, factory default)
   2 - 1200 bps (V.22)
   4 - 2400 bps (V.22bis)
   6 - 4800 bps (V.32)
   7 - 9600 bps (V.32)
   70 - 4800 bps (V.110 or X.31 flag stuffing)
   71 - 9600 bps (V.110 or X.31 flag stuffing)
S Registers:

S0= Number of rings to answer. Range 0-7 (Default 0 – No answer)
S2= Escape sequence character Range 0-255 (Default 43 = +)
S3= CR character Range 0-127 (Default 13 - Cntrl M)
S4= LF character Range 0-127 (Default 10 - Cntrl J)
S5= Back space character Range 0-127 (Default 8 -Backspace)
S6= Wait before blind dialling Range 2-255 (Default 2 – 2 secs)*
S7= Wait for carrier Range 1-255 (Default 50 – 50 secs)
S8= Comma Pause time Range 1-255 (Default 2 – 2 secs)*
S10= Carrier loss to hang up time Range 1-254 (Default 2 – 0.2 secs)*
* Compatibility only

Modem result codes:

<table>
<thead>
<tr>
<th>Numeric (V0)</th>
<th>Verbose (V1)</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>OK</td>
<td>Command line executed without errors.</td>
</tr>
<tr>
<td>1</td>
<td>CONNECT</td>
<td>Connection.</td>
</tr>
<tr>
<td>2</td>
<td>RING</td>
<td>Ringing signal detected.</td>
</tr>
<tr>
<td>3</td>
<td>NO CARRIER</td>
<td>Carrier lost or never present.</td>
</tr>
<tr>
<td>4</td>
<td>ERROR</td>
<td>Invalid Command.</td>
</tr>
<tr>
<td>6</td>
<td>NO DIAL TONE</td>
<td>No dial tone detected.</td>
</tr>
<tr>
<td>7</td>
<td>BUSY</td>
<td>Busy signal detected.</td>
</tr>
<tr>
<td>8</td>
<td>NO ANSWER</td>
<td>No answer from remote modem.</td>
</tr>
</tbody>
</table>

GPRS operation

AT+Gn
AT+G0 - Sets to CSD mode.
AT+G3 - turns on 8N1 GPRS Mode
AT+G4 - turns on 7E1 GPRS Mode
AT+G5 – Elster SMS mode.
AT+G6 – PRI SMS mode with password
AT+G7 – PRI SMS mode
(Autosave)

SMS Operation
This along with GPRS operation is a more advanced feature and consulting with ASLH first is necessary.
Remote Access

The ASLH 306 modem has the ability to be remotely accessed for both testing and configuration purposes. This information is reserved for advanced use and you should consult ASLH prior to performing this.

Using the LED’s to identify the status of the unit

ASLH GSM modems have 3 LEDs:
Green gives the modem status - explained below.
Red indicates the network status – explained below.
Yellow indicates signal strength – explained below.

Green LED

Slow flash (once every 3 seconds) CSD mode (waiting for call)
Fast flash (twice a second) during a call
Faster flashing (approx 5 flashes per second) during GPRS mode
Almost on (approx 14 flashes per second) SMS during a read

Yellow LED

Off / Slow Flash / On with increasing signal levels
The more ‘on time’ the better the signal

Red LED

Off for module off
Flashing on / off 0.5 sec when not registered
Long pauses short blinks when registered with network
On when a call initiated and during a CSD call
Technical Specifications

Configuration and Rates

9600 bps, 4800 bps, 2400 bps, 1200 bps.

Data Format
10 bit character length including parity, start and stop bits.
1 start bit.
7 or 8 data bits.
0 or 1 parity bit.

Modem Operation

Controlled by AT commands and supporting S registers.

Data Modulation.

V22 - 1200 bps
V22bis - 2400 bps
V32 2400 – 9600 bps
V110 2400 – 56000 bps
Fax Group 3, Class 1 & 2
GPRS Class B (4+1), up to 85.6 kbps

Equipment Interface
CCITT V.24/V.28

GPRS – Mobile Originate and Listen modes. (Class 10)
Appendix1 – Sim Insertion

The new ASLH306 Delta Plus modem has been modified to have a new sim carrier. This will reduce the possibility of broken sim carriers and incorrect operation due to bad sim insertion.

Holding the modem with its serial number facing towards you the correct way up with the 25way connector at the top, the sim slot should be in your bottom left.

The sim goes in with the chip facing away from you and the slanted end inserted first.

Just push the sim card in straight and it should have a springy feel when inserted. If you then push a little further it should click and lock in. You may need to use your finger nail or thumb to push fully home.

To release the sim simply push the sim in further and it will release. It’s a ‘push push’ mechanism.

If the sim is put in the wrong way round it will not click in. Once inserted properly the sim will sit flush with the edge of the modem.

So long as the sim is active, your red led on the modem should start short flashes on for ½ sec and off for 2 ½ sec intervals to indicate the modem has registered with the network. It may take up to 30sec for this to take place depending on modem variant and signal quality.

Please note.
If these guidelines are not followed, this may invalidate your warranty.