N701-AT User's Guide

(Quad band GSM/GPRS modem module)

AISA Tech
Automotive Information & Security Assist

Notice
Congratulations on choosing the N701-AT Quad Band GSM/GPRS modem module.
Please read this User Guide thoroughly before use of N701-AT so that you understand all of the features and functions.
Please note that use of unauthorized accessories and interfacing could cause harm to you, your N701-AT or both and will void the warranty. Only use the module in a way of AISA Tech User's Guide and technical manual specifies.
AISA Tech reserves the right to make changes and improvements to any of the products or accessories described in this guide without prior notice.
note) Some service providers do not support all of the functions described in this User Manual. See additional documentation from your service privider.

Security
If your module or a model uses the module is lost or stolen, you must report it to your network operator or service provider so that they can restrict the module and model from use.
This is important, as you may be liable for the cost of unauthorized calls and SMS, data transactions until the equipment is restricted.
You can help prevent such mobile phone crime by taking the following pre-cautions:
- Don't leave your module or model visible in a vehicle when you leave it.
- Make a note of the IMEI number. This number will be found on the bottom side of the AVL.

Safety
Personal
- FCC regulations limit exposure to radio frequency (RF) radiation. To comply with these regulations, operators of this device must maintain a distance of at least 20 cm from the antenna. While the device is on, the operator's body and parts of the body such as eyes, hands, or head, must be 20 cm.or farther from the antenna .
- Operation of any radio equipment including N701-AT module and a model uses it may interfere with the function of inadequately shielded medical devices such as hearing aids and pacemakers. You must consult the manufacturer of these devices or your physician, before use.
- Do not switch on your N701-AT in hospitals unless in areas where it is clearly marked to do so. N701-AT continue to transmit call responses even if left in stand-by mode. You must switch off when requested to do so.
- Do not move the antenna close to, or it to touch any exposed part of the body when the N701-AT is turned power on; a damaged antenna may cause a minor burn.

N701-AT Use

- Your N701-AT module produces magnetic fields. Do not place next to magnetic storage media such as computer diskettes or credit cards when it is powered on.
- Operating your N701-AT module close to other electrical equipment such as televisions, phones, radios and personal computers, may cause interference. Once again, please turn you N701-AT power off when entering a Hospital; Medical Equipment can be affected.
- Do not expose N701-AT module to strong sunlight, direct heat or liquids (such as water and solvent).
- Do not expose your N701-AT module to strong ESD (Electro Static Discharge) since the ESD could result incorrect behavior of the N701-AT module.

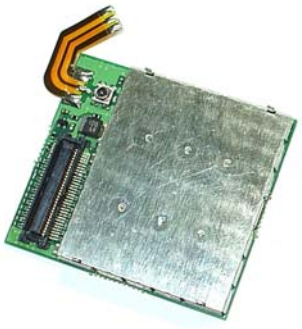
On the Road

- Before making or receiving calls, acquaint you thoroughly with the applicable local laws and guidelines regarding the use of mobile radio device and telephones and observe them at all times.
- Air safety bags, anti-lock brakes, speed control and fuel injection systems are normally immune to radio transmissions but if you experience problems, consult your vehicle dealer.
- Turn off you N701-AT module when refueling or where there are signs restricting the use of 2-way radio equipment. Do not store or carry flammable or explosive materials in the same compartment as your N701-AT module.

Inside Aircraft

- Switch off your N701-AT module when in an aircraft. The use of GSM/GPRS module/model in an aircraft may be dangerous to the operation of the aircraft, disrupt the cellular network and is illegal.

Product overview,
The N701-AT composed of following interfaces.



*size : 33.5 x 37.5 x 3.9mm

- N701-AT interface ports and indicators -

Pin	Description	Type	Remark
1	VBAT	Power	+ 3.4~4.0 Volts
3	VBAT	Power	+ 3.4~4.0 Volts
5	VBAT	Power	+ 3.4~4.0 Volts
7	VBAT	Power	+ 3.4~4.0 Volts
9	VCHARGE	CHG	+ 5~6 Volts @700mA
11	VCHARGE	CHG	+ 5~6 Volts @700mA
13	SIM_VCC	VCC	+ 2.85 Volts output
15	SIM_IO	I/O	SIM I/O
17	SIM_CLK	O	SIM Clock
19	SIM_RST	O	SIM reset
21	MRSTO	-	JTAG signal
23	MTSRO	-	JTAG signal
25	SCLK0	O	SPI clock line

Pin	Description	Type	Remark
2	GND	GND	Ground
4	GND	GND	Ground
6	GND	GND	Ground
8	GND	GND	Ground
10	DCD	I	UART0 DCD input
12	DTR	I	UART0 DTR output
14	CTS_0	I	UART0 CTS input
16	RTS_0	O	UART0 RTS output
18	RXD_0	I	UART0 Rx Data
20	TXD_0	O	UART0 Tx Data
22	RI	O	Ring Indicator output
24	DSR	I	UART0 DSR input
26	RXD_1	I	UART1 Rx Data

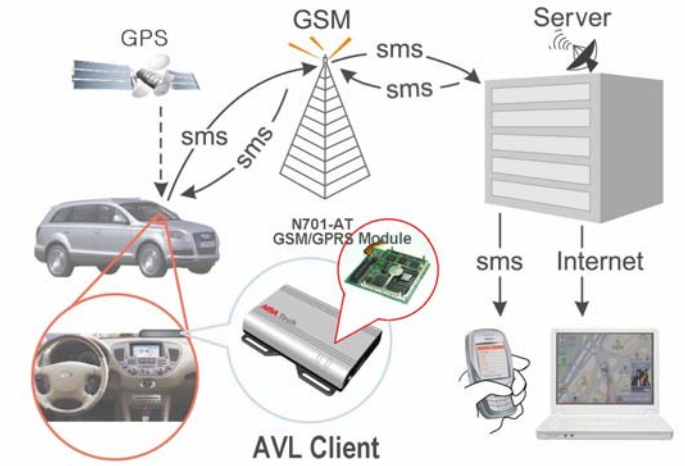
- N701-AT interface ports and indicators – continued.

Pin	Description	Type	Remark	Pin	Description	Type	Remark
27	SCL	O	I2C clock line	28	TXD_1	O	UART1 Tx Data
29	SDA	I/O	I2C data line	30	KEYOUT0	O	Key matrix output 0
31	CKL0_DAI	-	DAI signal	32	KEYOUT1	O	Key matrix output 1
33	RXD_DAI	-	DAI signal	34	KEYOUT2	O	Key matrix output 2
35	TXD_DAI	-	DAI signal	36	KEYOUT3	O	Key matrix output 3
37	WA0_DAI	-	DAI signal	38	KEYOUT4	O	Key matrix output 4
39	EXTRSTN	I	System reset input	40	KEYOUT5	O	Key matrix output 5
41	MICP1	Audio	Mic 1 input -positive	42	KEYIN0	I	Key matrix input 0
43	MICN1	Audio	Mic 1 input -negative	44	KEYIN1	I	Key matrix input 1
45	EPPA1B	Audio	Earpiece output 1	46	KEYIN2	I	Key matrix input 2
47	EPPA2A	Audio	Earpiece output 2	48	KEYIN3	I	Key matrix input 3
49	MICP2	Audio	Mic 2 input, -positive	50	CAP19	I/O	GPIO
51	MICN2	Audio	Mic 2 input, -negative	52	CAP02	I/O	GPIO
53	AUOP	Audio	Loud speaker output	54	CAP05	I/O	GPIO
55	AUON	Audio	Loud speaker output	56	CAP06	I/O	GPIO
57	ADC1	AI	A/D converter input	58	CAP00	I/O	GPIO(Interrupt supported)
59	ADC2	AI	A/D converter input	60	CAP22	I/O	Headset detection

***Antenna port of the N701-AT module form a Coplanner strip line, for other types of antenna connector such as MMCX female, please consult with your N701-AT supplier.

***FCC regulations limit exposure to radio frequency (RF) radiation, To comply with these regulation, an antenna to be used with the N701-AT GSM/GPRS modem module shall be remain an antenna gain of not greater than 0dBi.

Introduction.
Your N701-AT AVL is a GSM/GPRS based device that interact with a sever to remotely collect vehicle navigational information. – see also picture 1 below –



- Picture 1 -

Features :

- Quad band GSM/GPRS.class 8
- GPRS Class B mobile station
- support SMS and TCP/IP
- Integrated GPS receiver.
- Built in GSM/GPRS antenna.
- support 1.8V and 3V SIM interface.
- 3.4 ~ 4.0 Volts of supply voltage.
- 4 GPIO, 4x6 Keypad matrix.
- 2 A/D converter inputs.
- 1 high speed SPI output.
- UART0 with CTS/RTS flow control speed at 115200 bps.
- UART1 without flow control.
- I2C interface
- 2 Sets of Microphone inputs and earpiece outputs.
- 1 loud speaker output

Basic operation

Your N701-AT support GSM07.07(ETSI TS 100 916) and GSM07.05(ETSI TS 100 585) compatible quad band GSM/GPRS module with following proprietary AT commands.

For more details of applicable AT commands and AT commands descriptions, please refer to GSM07.07(ETSI TS 100 916) and GSM07.05(ETSI TS 100 585) Technical specification for detail.

-N701-AT proprietary AT commands.

a) AT+CPWROFF : power off the module.

b) AT+CGDATA=[<L2P>,[<cid>,[<cid>[….]]]] : Enter data state.

Command	Possible responses
AT+CGDATA="PPP",1	CONNECT It follows data transfer or CME ERROR:<error>
Test command AT+CGDATA=?	+CGDATA:"PPP" i.e. +CGDATA(list of supported<L2P>s) OK

Note: Possible are protocols : "PPP", "M-HEX", "M-RAW-IP". After entering AT+CGDATA="M-Hex",1
the protocol can be used as follows:
Syntax : <int: counter><int: length[1-1500]><hex-sequence>[0-9-fA-F]
Examples:

- 1 200<CR> - send 1 packet with 200 0x2B (fill character)
- 5 1000<CR> - send 5 packets with 1000 0x2B (fill character)
- 1 5 31 32 33 34 35<CR> - send 1 packet with the given contents
- 1 10 31<q><CR> - send 1 packet with 10 0x31

Either a packet is sent
- if the length field is terminated with <CR>
- or the length value is equal to # chars of hex-sequence
- or the input is terminated with a character not equal to hex digit or <CR>

The session is terminated by default with +++, the context is deactivated.
If ct108 (AT&D) is equal to 2 and the selected L2 protocol is "M-HEX", the channel is switched back to idle mode but the context remains activated. Leave the layer 2 packet protocol by typing of +++.

Trouble shooting.
Your N701-AT AVL has no user accessible parts inside and open up the cover could result ham to user.
Bring authorized service person through your dealer for service.

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