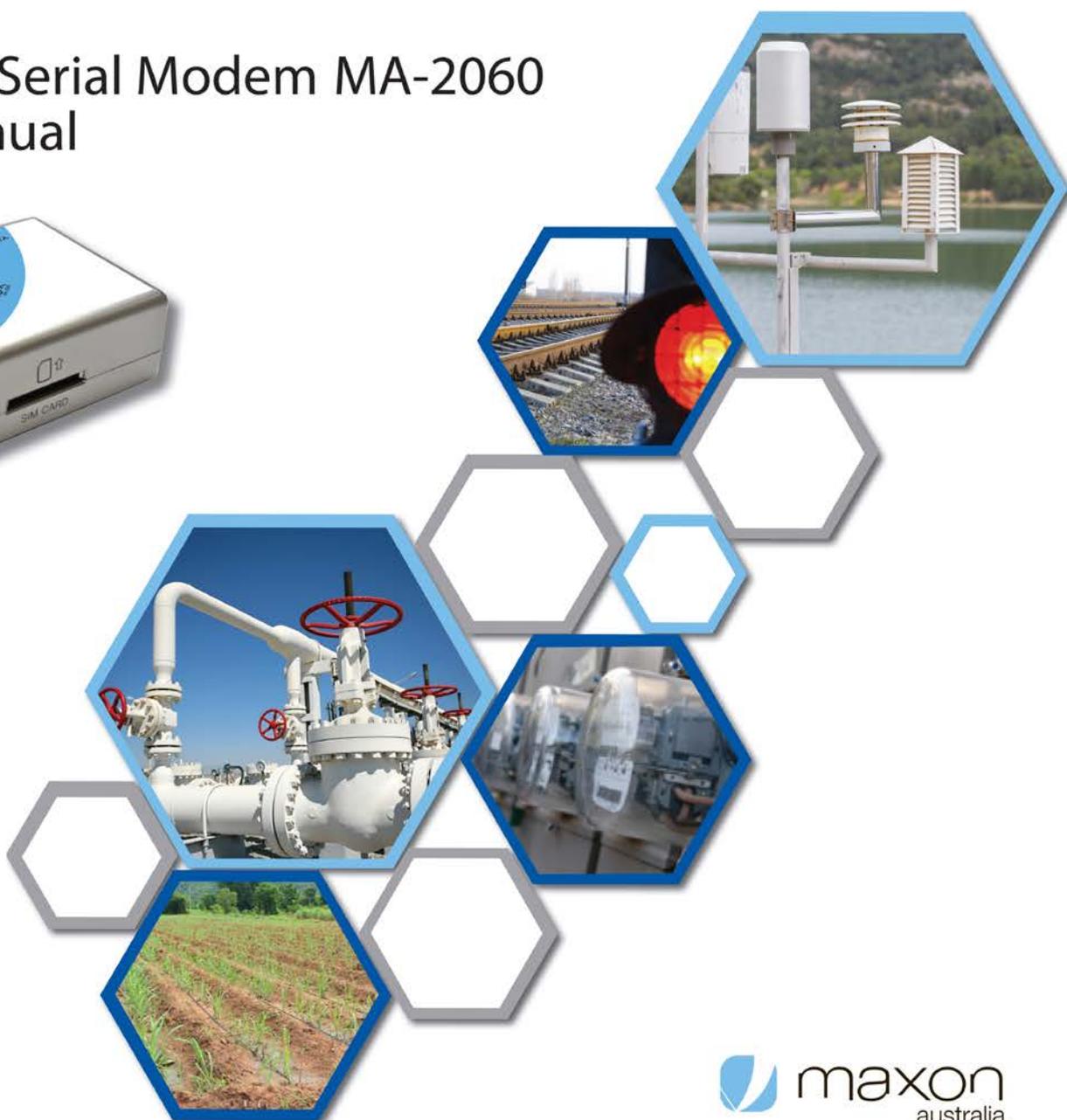


## M2M 3G Serial Modem MA-2060 User Manual



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## CONTACT INFORMATION

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In keeping with Maxon's dedicated customer support policy, we encourage you to contact us.

### TECHNICAL:

Hours of Operation: Monday to Friday 8.30am to 5.30pm\*

Telephone: +61 2 8707 3000

Facsimile: +61 2 8707 3001

Email: [support@maxon.com.au](mailto:support@maxon.com.au)

\* Public holidays excluded

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Locked Bag 2007

Seven Hills NSW 1730

Australia

# RF EXPOSURE & ELECTRICAL SAFETY

## COMPLIANCE

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The use of this device in any other type of host configuration may not comply with the RF exposure requirements and should be avoided. During operation, a 20 cm separation distance should be maintained between the antenna, whether extended or retracted, and the user's/bystander's body (excluding hands, wrists, feet, and ankles) to ensure RF exposure compliance. The modem is not designed for, nor intended to be, used in applications within 20 cm (8 inches) of the body of the user. Continued compliance of the equipment relies upon it being used with an AS/NZS 60950.1 approved SELV power supply.

### Caution

Change or modification without the express consent of Maxon Australia Pty. Ltd. voids the user's authority to use the equipment. These limits are designed to provide reasonable protection against harmful interference in an appropriate installation. The modem is a transmitting device with similar output power to a mobile phone. This equipment generates, uses, and can radiate radio frequency energy and, if not used in accordance with instructions, can cause harmful radiation to radio communication. The modem is approved for use with the antenna: **ANT-SMA**. Unauthorized antennas, modifications, or attachments could impair call quality, damage the device, or result in violation of RF exposure regulations.

However, there is no guarantee that interference will not occur in a particular installation. If the equipment does cause harmful interference in radio and television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving radio or TV antenna
- Increase the separation distance between the equipment and the receiver
- Contact Maxon Australia Technical Support for assistance.

## General Safety

**RF Interference Issues:** Avoid possible radio frequency (RF) interference by carefully following safety guidelines below:

- Switch OFF the modem when in an aircraft. The use of cellular telephones in aircraft is illegal. It may endanger the operation of the aircraft and/or disrupt the cellular network. Failure to observe this instruction may lead to suspension or denial of cellular services to the offender, legal action, or both.
- Switch OFF the modem in the vicinity of gasoline or diesel fuel pumps or before filling a vehicle with fuel.
- Switch OFF the modem in hospitals and any other place where medical equipment may be in use.
- Respect restrictions on the use of radio equipment in fuel depots, chemical plants, or in areas of blasting operations.
- There may be a hazard associated with the operation of your Modem in the vicinity of inadequately protected personal medical devices such as hearing aids and pacemakers. Please consult the manufacturers of the medical device to determine if it is adequately protected.
- Operation of the modem in the vicinity of other electronic equipment may cause interference if the equipment is inadequately protected. Observe any warning signs and manufacturers' recommendations.
- The modem contains sensitive electronic circuitry. Do not expose the modem to any liquids, high temperatures or shock. The modem is not waterproof. Please keep it dry and store it in a cool, dry place.
- Only use original accessories or accessories that are authorized by the manufacturer. Using unauthorized accessories may affect your modem's performance, damage your modem and violate related national regulations.
- Always handle the modem with care. There are no user serviceable parts inside the modem. Unauthorised dismantling or repair of the modem will void the warranty.



\* The product needs to be supplied by a limited power source or the power supply provided. Otherwise, safety will not be ensured

\* Do not fixed the product in an open area where it is liable to lightning strike hazard.

## Vehicle Safety

- Do not use the modem while driving.
- Respect national regulations on the use of cellular telephones in vehicles. Road safety always comes first.
- If incorrectly installed in a vehicle, the operation of the modem could interfere with the correct functioning of vehicle electronics. To avoid such problems, be sure that the installation has been performed by qualified personnel.
- Verification of the protection of vehicle electronics should be part of the installation.

**Note:** The user is cautioned that changes or modifications not expressly approved by Maxon Australia could void the warranty.

## Potentially Unsafe Areas

**Posted Facilities:** Turn off this device in any facility or area when posted notices require you to do so.

**Blasting Areas:** Turn off your device where blasting is in progress. Observe restrictions and follow any regulations or rules.

**Potentially Explosive Atmospheres:** Turn off your device when you are in any area with a potentially explosive atmosphere. Obey all signs and instructions. Sparks in such areas could cause an explosion or fire, resulting in bodily injury or death.

Areas with a potentially explosive atmosphere are often but not always clearly marked. They include:

- Fuelling areas such as gas or petrol stations, or below deck on boats
- Transfer or storage facilities for fuel or chemicals
- Vehicles using liquefied petroleum gas, such as propane or butane
- Areas when the air contains chemicals or particles such as grain, dust or metal powders
- Avoid using the modem in areas that emit electromagnetic waves or enclosed metallic structures e.g. lifts.
- Any other area where you would normally be advised to turn off your engine

## REVISION HISTORY

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Product	Intelimax LITE M2M 3G Serial Modem
Model	MA-2060
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Level	Date	History
1.00	April 2015	Initial Release
1.01	May 2015	Upgrade process and SMS commands changes
1.02	July 2015	Overall Improvements include manual content, screenshots, and formatting
1.03	Aug 2015	Small changes in explanation of &D options.
1.04	Aug 2015	Small changes in periodic reset options.
1.05	Aug 2015	Add details on powering up and powering down process
1.06	Sept 2015	Updated LED display function table Updated GUI connection to the modem Added operation mode "Outstation" and revised Serial Modem mode Added local firmware upgrade process
1.07	Oct 2015	Added System Recovery section
1.08	Oct 2015	Added further detail on serial modem mode
1.09	Nov 2016	Overall improvement on functions and AT commands.

## DISCLAIMERS

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Life support – This product is not designed for use in life support appliances or systems where malfunction of these products can reasonably be expected to result in personal injury.

Maxon Australia customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Maxon Australia for any damages resulting from such application.

Right to make change - Maxon Australia reserves the right to make changes, without notice, in the products, including circuits and software, described or contained herein in order to improve design and/or performance.

Some features outlined in this manual may require an updated firmware version and/or GUI version to work. Please contact Maxon Australia for more information.

# INTRODUCTION

---

## Overview

Intelimax LITE is a unique and intelligent fusion of 3G capabilities with advanced functionality of a modem/router in a smart and compact design.

## Intelimax LITE Features

### General Features

- HSPA Wireless Module (7.2Mbps downlink, 5.6Mbps uplink)
- Supports Packet and Circuit Switched Data
- RS232 and RS485 (as separate model)
- 2 Way SMS
- Inbuilt TCP/IP, UDP/IP STACK
- Remote CSD to IP Changeover
- AT over IP
- Remote / local user interface
- Remote SMS diagnostics & reset
- Programmable periodic reset and other watchdog features
- Save and restore modem configuration from a file
- One customer profile configuration
- FOTA - Firmware upgrade over the air
- External antenna connectivity to maximise HSPA coverage
- External LED to show Network and Connection status
- Rugged plastic casing for industrial use

### Frequency Bands

- WCDMA/HSPA 800MHz, 850MHz, 900MHz, 1900MHz, 2100MHz
- GSM/GPRS/EDGE 850MHz, 900MHz, 1800MHz and 1900MHz

### Data Speeds

- HSPA: UL 5.76 Mbps / DL 7.2 Mbps
- WCDMA PS: UL 384 Kbps / DL 384 Kbps
- WCDMA CS: UL 64 Kbps / DL 64 Kbps
- GPRS/EDGE: UL 236 Kbps / DL 236 Kbps
- GSM CS: UL 9.6 Kbps / DL 9.6 Kbps

### Connections

- RJ45 Connection
- USB Connection
- SIM Card Holder
- Antenna connector: SMA female

### LED Lights

- Power / RSSI
- Data

### Operating Systems

- Windows XP/ Vista / 7 / 8

### Power Source

- DC Input Voltage Range: 5 to 48 VDC with  $\pm 10\%$  tolerance
- Idle Current: 20mA @ 12V
- Maximum Current: 220mA @ 12V

### Dimensions

- 71mm x 55mm x 26mm (without side brackets and antenna)

### Mounting

- Side mounting brackets

### Environmental Specifications

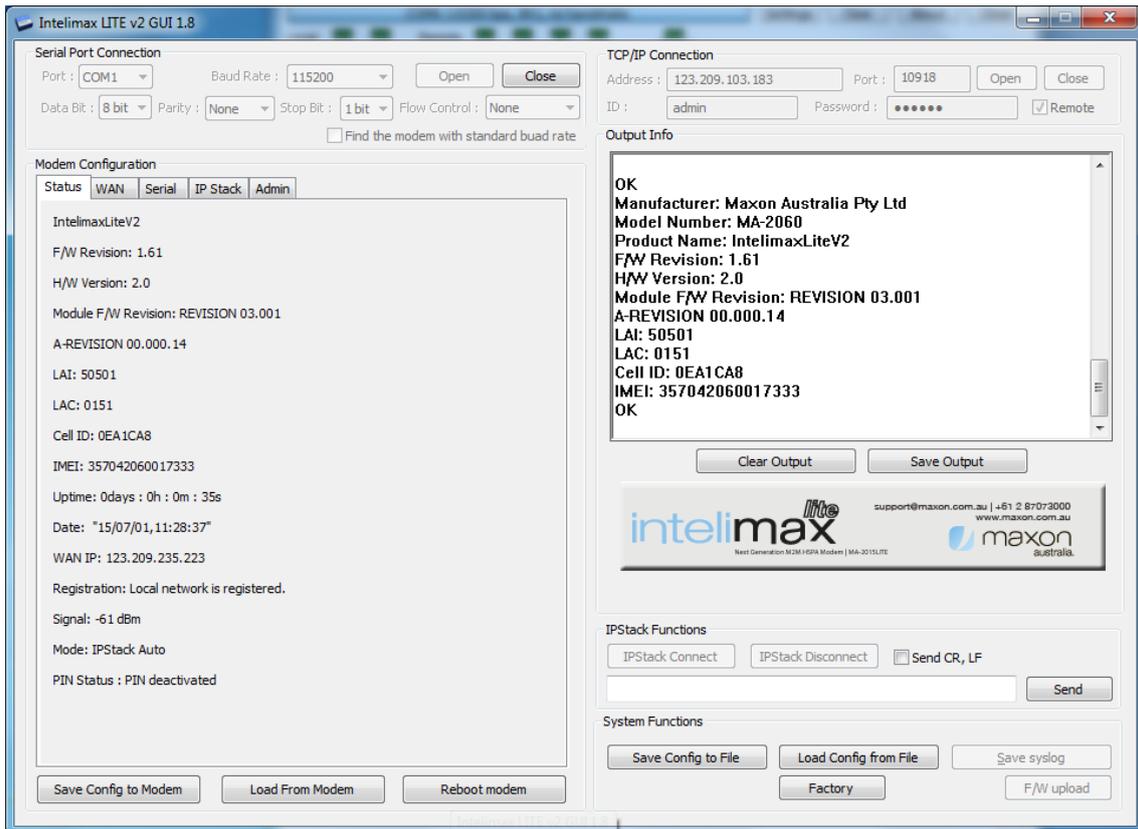
- Normal Operation Temperature -30 to 85°C
- Extreme Operation Temperature -40 to 85°C

### Approvals / Compliance

- RCM (both modem and module)
- FCC (both modem and module)
- GCF (module only)
- PTCRB (module only)
- CE (module only)
- RoHS (both modem and module)
- Carrier Approvals\* - (Please contact Maxon Australia for more information)

# INTEЛИMAX LITE SET UP

Maxon Intelimax LITE serial modem supports a Windows GUI, where by you can configure the modem via serial connection or remotely via the WAN IP.



After connecting to the modem using the GUI, users can check modem status and configure WAN, IP Stack, and Admin settings.

# CONNECTING THE INTELIMAX LITE

---

## Powering the Modem

The Intelimax LITE can be supplied power through either the RJ45 socket or the USB connector. Please note that there must be a gap of at least three (3) seconds between two successive power reconnections of the modem, otherwise the modem may not power on. If powering down the modem at a regular interval then always apply the AT+RTD command to put the modem into the appropriate state to shutdown power including performing house-keeping duties and deregistering from the network.

## Bootup Process

It is important to wait for 1 seconds after the following message is sent before talking to modem via serial which indicates that the modem is fully booted and ready:

**IP or Outstation Modes:** "INTELIMAX READY"

Or

**In Serial Mode:** "+PB Ready"

## Serial Connection

Serial connection can be via either the RS232 interface on RJ45 port or a dedicated virtual serial port over USB.

An RJ45 to DB9 (Female) cable is required when using serial port over RJ45 on Intelimax LITE. User also need to ensure proper serial port settings, such as COM port number on your PC, baud rate, data frame, and flow control, are used. By default the connection settings are:

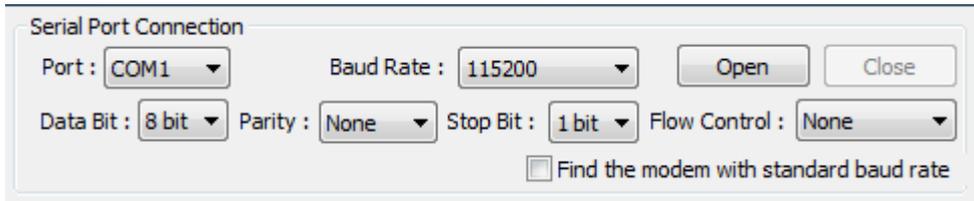
Baud Rate: 115200

Data bit: 8 bit

Parity: None

Stop bit: 1 bit

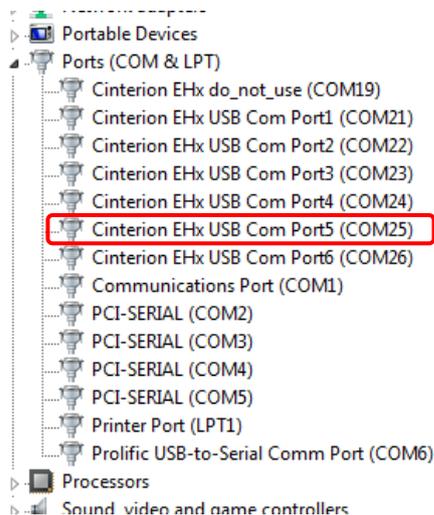
Flow control: None



Once the serial port is properly set, click the open button and the Intelimax LITE GUI will connect to the modem via the selected COM port.

If the baud rate of the modem is unknown, the GUI is able to find the right value by checking "Find the modem with standard baud rate". Please note that this is only for baud rate. GUI software cannot find the correct data frame and flow control settings by itself.

When using the virtual serial port over USB, the modem needs to be connected to PC via mini USB port first. Serial port over RJ45 can be connected after or just left unconnected if not required. After the modem is connected to PC via USB port, several virtual serial ports will be populated on computer (if the USB driver of Cinterion Module has been properly installed). By opening Device Manager under Windows, these ports can be found in "Ports (COM&LPT)" as shown below.



Among those Cinterion EHx USB Com Ports, the Port5 is dedicated for GUI configuration. Please use the port number associated with the port under Windows (for example,

COM25 as shown the picture) for the GUI to connect to modem. Other serial settings will have no effect when using the USB port.

**IMPORTANT:**

1. There will be about 30 seconds delay for USB COM to function properly after modem gets powered.
2. The USB COM port has to be closed before modem is re-connected to PC via USB. Otherwise, the USB port will not operating properly. This applies to any software that opens the modem's USB COM ports.
3. If the correct information is not displayed via COM port 5 the modem may have to be rebooted.

## WAN Connection

The GUI can connect to the modem remotely via WAN IP. This can be achieved when the modem is in an IP mode and connected to the cellular WAN with an IP address that allows in-bound TCP connection. The modem IP address can be retrieved by sending the following SMS to the modem: **INTELIMAX.PARK.WANIP** (or using the AT command AT\$WAN).

To connect to the modem, put the modem IP address and port number (always 10918) under TCP/IP Connection and tick the "Remote" option, then click the "Open" button.

TCP/IP Connection

Address : 123.209.235.223 Port : 10918 Open Close

ID : admin Password : ●●●●●●  Remote

Logon credentials are required for a remote connection. By default, the username and password are both admin and are configurable in the GUI on the admin tab.

# Modem Configuration

---

## Modem Status

The modem status page displays modem information such as network registration and WAN connectivity status.



Information displayed on the Status page:

Up time:	Elapsed time since modem last reboot (soft or hard)
System time:	Date and Time acquired from Cellular Network
IMEI:	IMEI number of the Intelimax LITE
Version:	Firmware version number
H/W Version:	Product's board release version

Module Version:	Cellular engine's firmware version
Network registration:	Shows registration status and carrier
Network Band:	Shows Network band in use
PIN Status:	Status of the SIM pin setting
Area information:	LAI, LAC, Cell ID
Signal Level:	Current signal strength in dBm
Mode:	Operating mode of Intelimaxlite, IP or Serial Modem. In serial modem mode, it will also display whether modem is in connected call
Server status:	Will display whether the modem is in listening or connected states
WAN IP:	IP address assigned by carrier

## WAN Configuration

The WAN configuration page is used to configure how the modem will connect to the Cellular (3G) network. Please select the correct operation mode as this will decide if the modem will automatically connect to the network on power up (AUTO), be prompted to connect via AT commands (MANUAL), or work as a serial modem in either outstation or pass through mode.

The Intelimax LITE supports 4 operating modes:

1. IP Stack Auto (Modem connects to the 3G networks and acquires an IP address and then runs the IP STACK server or client mode)
2. IP Stack Manual (Modem waits for user to send AT commands before connecting to the 3G networks and acquiring an IP address)
3. Outstation (Modem is used to initiate or receive circuit switched data calls)
4. Serial Modem (Pass through mode – connects to the 3G module in the modem)

The screenshot shows the 'Modem Configuration' window with the 'WAN' tab selected. The settings are as follows:

- Mode:** IP Stack Auto (dropdown)
- APN:** telstra.extranet (text field)
- Dialup:** \*99# (text field)
- Auto Pin:** Disable (dropdown) | **Pin Code:** (text field)
- Username:** (text field)
- Password:** (text field)
- Authentication:** PAP & CHAP (dropdown)
- Band:** A grid of radio buttons for various cellular bands. Checked options include GSM 850, GSM PCS, EGSM 900, GSM 1800, and UMTS 850.
- Periodic Reset:** 24 (dropdown) Hours
- Additional options:** TCP Server Listening, TCP Connection State, At scheduled time (00:00), and Battery (all unchecked).

The WAN tab allows configuring the following features (only APN and authentication type are needed in serial modem mode):

- APN and dialup string
- Username and password for IP WAN  
Please note that, for security reasons, the password saved to the modem cannot be read back and displayed. Instead, the password field will only show “●●●” and the password in the modem will not be changed unless the content of the field is modified.
- Auto pin settings (Intelimax LITE will enter the PIN code if SIM pin is Enabled)
- Network authentication information
- Band
  - At least one GSM band and one WCDMA band must be selected
  - The modem has to be power cycled after any band change
- Periodic reset
  - Intelimax LITE will periodically do an internal reboot as per the hours set and conditions defined below
  - In Outstation and Serial Modem mode, modem will wait until there are no active call
  - TCP Server Listening – For TCP Server mode. If checked, modem will wait until there are no TCP connections
  - TCP Connection State – For TCP Client mode. if checked, modem will wait until there are no TCP connections

**Invalid PPP password characters list:**

“ (double quotation mark)

‘ (quotation mark)

? (question mark)

) (bracket)

@ (at sign)

; (semi colon)

| (pipe sign)

l (upper case l)

### *IP Stack Auto Mode*

When using IP STACK Auto mode the modem will automatically initiate PPP and socket connection and behave as an IP Serial modem. The modem will packetise all incoming data via the serial port and transfer to the remote and vice versa.

The Intelimax LITE IP Stack can be configured as a Server or Client mode. In Server mode the Intelimax LITE will act as a socket server. The modem will listen on a specific TCP/UDP port waiting for an incoming client socket connection. As soon as the client drops the socket connection, the Intelimax LITE will go back to socket listening mode as per the IP stack configuration. When in client mode the Intelimax LITE will try to establish a socket connection to a preconfigured server IP address or DNS name and port number. The client mode also supports a secondary server IP address just in case the primary server cannot be reached.

### *IP Stack Manual Mode*

With IP Stack manual mode, the modem doesn't initiate the PPP connection. The modem will rely on the host device connected via serial to send the PPP initiation commands.

The AT command to Start the PPP session and open a socket are AT\$\$IPCTOP and AT\$\$IPCTOS. The AT commands to close the socket and PPP session are AT\$\$IPCTCS and AT\$\$IPCTCP.

The Intelimax LITE supports \$\$ AT commands for IP Stack Manual connections which are detailed in the section "Extended / Intelimax LITE Specific AT Command Set".

### *Circuit Switched Data Call – OutStation Mode*

Circuit Switched Data is a legacy style of communications where the user dials in to the modem data terminating number. The modem can also dial in to another modem using its data terminating number.

Set of AT commands used in Outstation mode:

ATD	Dial the Data number
ATA	Answer the Data Call
ATS0=n	Set auto answer where n=number of rings
*** / +++AT	Escape command to enter online command mode Note: "+++" is supported in Serial Modem mode only not in outstation mode.
+++ATH	Drops the data call in data mode
ATO	Return to data mode from online command mode
ATH	Drops the data call in command mode
AT&D	Set the DTR line mode
AT&C	Set the DCD line mode

Multiple AT commands in a single string is not supported in this mode.

To use Circuit Switched Data please ensure the following has been setup on the SIM:

1. Contact SIM service provider and make sure that CSD is activated on the Sim card. Generally this requires a second number (data terminating number) attached to the same service.
2. Configure the modem to auto answer the call, or make sure that the equipment connect to the modem has auto answer activated to detect an incoming call and sends ATA to answer the data call.

Please be aware that, under Outstation Mode, packet switched data call using ATD\*99# or ATD\*99\*\*\*1# is not supported due to the limitation of the 3G module in the modem. If customers wish to use such PPP dial up, please set up the modem in Serial Modem Mode.

### *Serial Modem Mode*

When configured in this mode, the modem will work as a pass-through modem, meaning that the serial port directly connects to the 3G module inside the modem and the connection is completely controlled by the end device. In this mode, the modem supports both circuit switched data (CSD) call (ATDT0400123456) and packet switched data (PSD) call (ATD\*99# or ATD\*99\*\*\*1# etc).

Set of AT commands used (standard Hayes AT commands are also supported):

ATD	Dial the Data number
ATA	Answer the Data Call
ATS0=n	Set auto answer a CSD call where n=number of rings
+++	Escape command to enter online command mode
ATO	Return to data mode from online command mode
ATH	Drops the CSD data call in online command mode
AT+CGATT=0	Drops the PSD data call in online command mode
AT&D	Set the DTR line mode
AT&C	Set the DCD line mode

To make a proper PPP dial up connection from the modem, the following commands have to be issued before starting the connection:

AT+CGDCONT=1,"IP","apn" Set the access point name (APN).

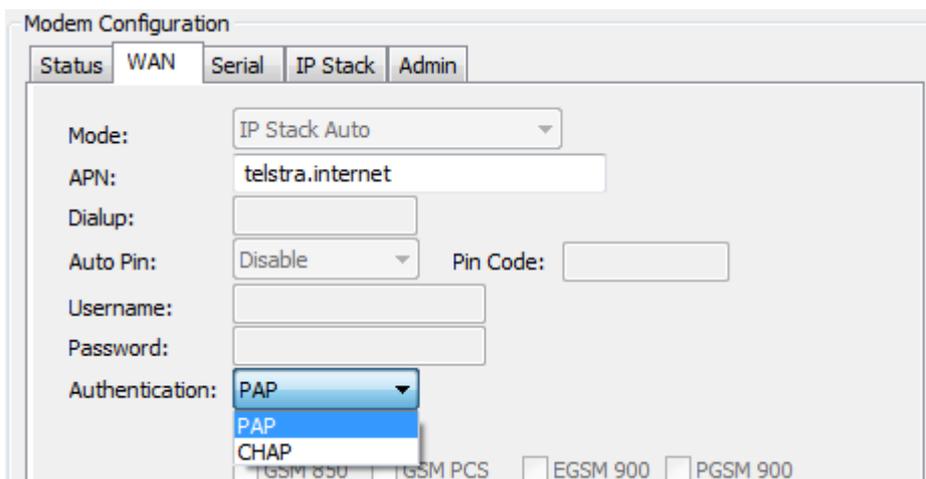
AT^SGAUTH=1,auth\_type,"",""

Set the Authentication. auth\_type can be: 0 - NONE, 1 - PAP, 2 - CHAP.

Unique userid and password do not have to be configured for each modem, just the authentication type, for non-authenticated APNs PAP authentication should be configured. For example:

- If using a non-authenticated APN (such as telstra.extranet) then configure AT^SGAUTH=1,1,"","".
- If using an authenticated APN (such as telstra.corp) then configure the appropriate authentication type, for PAP: AT^SGAUTH=1,1,"","" for CHAP: AT^SGAUTH=1,2,"","".

These settings can be configured on the modem in serial modem mode using the GUI connected to the modem via the serial interface. In this style of connection a reduced configuration is available (as noted below), the authentication type setting here will replicate the configuration of the AT^SGAUTH setting, please see the screenshot below.



The selection will be sent through to the GUI (via physical rather than USB serial connection) using the above mentioned AT^SGAUTH=1,x,"", "" command.

**Please note that, the serial port configuration, such as baud rate, flow control, data framing, and modem control settings such as ECHO, Auto Answer, &C, and &D, will be different from the other three modes and are unable to be configured via the GUI but the serial port only. Users can use AT commands over the serial port to make changes if required. Please also use AT&W to save the changes being made.**

The default settings of the serial port in Serial Modem Mode are **115200, 8N1**. The AT commands for changing the serial port settings are:

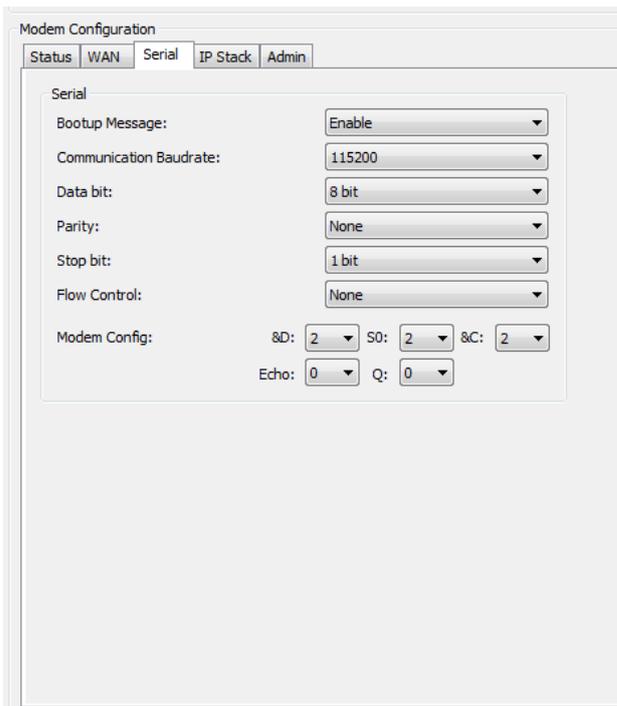
- AT+IPR - baud rate. Supports 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200
- AT\Qn - flow control. Supports no flow control (n=0) and RTS/CTS (n=3)
- AT+ICF - data framing
  - 7 bits, even parity, 1 stop bit (AT+ICF=5,1)
  - 7 bits, odd parity, 1 stop bit (AT+ICF=5,0)
  - 8 bits, even parity, 1 stop bit (AT+ICF=2,1)
  - 8 bits, no parity, 1 stop bit (AT+ICF=3)
  - 8 bits, odd parity, 1 stop bit (AT+ICF=2,0)
  - 8 bits, no parity, 2 stop bits (AT+ICF=1)

Please also be aware that, the extended/Intelimax LITE specific AT command Set (\$\$ commands) are not supported in Serial Modem mode.



## Serial Configuration

The serial configuration tab is used to configure all serial settings for the modem. Please note that this configuration does not apply to the serial port settings under Serial Modem mode.



### Serial Port Setup

Serial port setup includes the following:

- Baud rate (supports 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200)
- Data Bit (8 or 7 bits)
- Stop bit (1bit only)
- Parity (7N1 Not Supported)
- Flow Control (None, RTS/CTS)

The serial port speed setup should be set to match the host (connected via serial port) configuration. With certain applications there may be a need to fabricate a custom serial cable to work between the host and the Intelimax LITE. The custom serial cable depends on the equipment requirements and settings.

### *Modem Config*

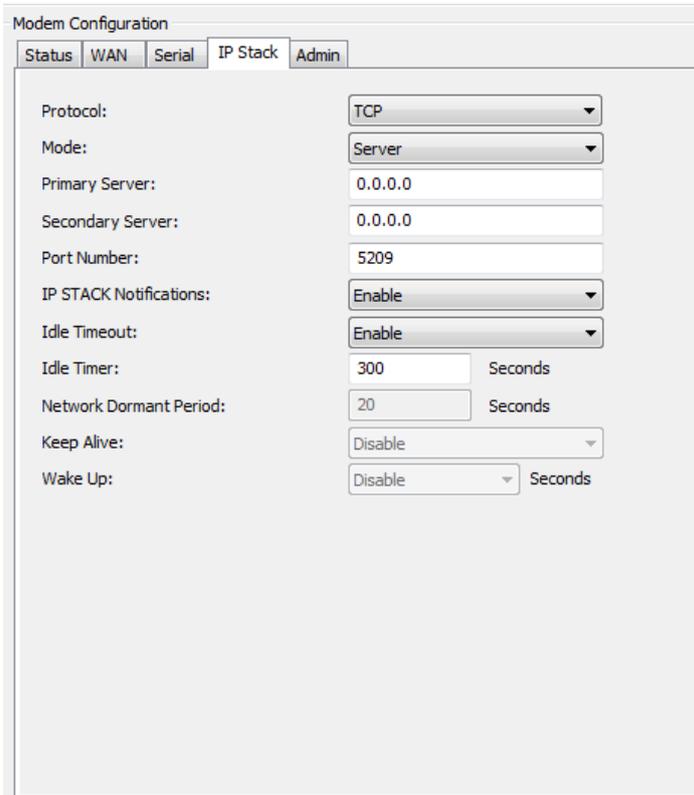
These are the AT commands that will be applied to modem after power up or reboot. For detailed information on these commands, please refer to "Extended/Modem Specific AT Command Set".

### *Boot up Message*

The Intelimax boot up message "INTELIMAX READY" is a message that the modem sends to the host via serial port upon boot up. Using this option the user can disable or enable this message. Not applicable in serial mode.

## IP Stack Configuration

IP stack configuration page is used to setup modem IP STACK settings such as port number and IP address and connection timeouts.



The screenshot shows the 'Modem Configuration' window with the 'IP Stack' tab selected. The settings are as follows:

Setting	Value
Protocol:	TCP
Mode:	Server
Primary Server:	0.0.0.0
Secondary Server:	0.0.0.0
Port Number:	5209
IP STACK Notifications:	Enable
Idle Timeout:	Enable
Idle Timer:	300 Seconds
Network Dormant Period:	20 Seconds
Keep Alive:	Disable
Wake Up:	Disable Seconds

### Protocol

The IP Stack supports TCP and UDP, depending on your application requirement you can choose between TCP and UDP communications.

### Mode

The Intelimax LITE supports two IP Stack operation modes:

**Server mode:** In Server mode the modem will establish a PPP connection and listen on a predefined port for incoming client requests.

**Client mode:** the modem will initiate a PPP connection and try to connect to the Primary server. If the connection to the server fails after 10 minutes of trying, it will try

the Secondary server, if the connection to the secondary server also fails after 10 minutes, the modem will drop the PPP connection, reboot and start all over again. Please use valid server IP addresses. Inaccessible IP addresses could cause extended retry timeout for the modem client service.

### *Primary Server*

Define the IP Address or DNS address of the primary server the Intelimax LITE will try to connect to in Client mode, in server mode please leave this field as default.

### *Secondary Server*

Define the IP Address or DNS name of the secondary server the Intelimax LITE will try to connect to in Client mode, in server mode please leave this field as default.

### *Port Number*

Define the TCP or UDP Port number, this port will be used in the server and client mode.

### *IP STACK Notifications*

IP Stack notification by default sent out on the serial port to the connected host. With some applications this may cause issues with data transfer and using this option the user can disable or enable the notification messages.

### *Idle Timeout / Idle Timer*

Enabling the idle Timeout and setting an Idle Timer, will set the Intelimax LITE to constantly check the IP STACK connection status. If the socket connection stays idle for the defined period of time, it will close the socket connection and retry depending on the setup.

### *UDP Session Control*

To enhance the reliability of UDP IP Stack communication, the Intelimax LITE has

configuration options for users to have more control over the UDP activity and data communication. The user can enable or disable keep alive in conjunction with the Network Dormant Period or alternatively specify Wake up time in seconds. Not supported on initial firmware release 2.05.

**Network Dormant Period:** By default the network puts the modem in dormant or standby mode within 20 seconds of no data activity.

**Keep Alive:** This sends a dummy UDP packet prior to modem going dormant and this is based on the Network Dormant Period, Usually this packet will be sent only if the modem doesn't send any data over the wireless network for the Network Dormant period. Enabling this could lead to additional delays in data transfer due to modem sending a dummy packet first to initialize the UDP connection with remote site.

**Wake Up:** The wake up feature will send dummy UDP packets prior to actual data, this wakes up the communication channel and guarantees sending the complete UDP data packet to the receiving end.

## Admin Settings

The screenshot shows the 'Admin' tab of the 'Modem Configuration' interface. It contains three sections: 'Login' with fields for 'Username' (admin) and 'Password' (masked with dots); 'Syslog' with 'System logs' set to 'Enable', 'Remote Syslog' set to 'Disable', and an 'IP address' field containing '0.0.0.0:3333'; and 'Administrators' with three empty input fields labeled 'Number 1:', 'Number 2:', and 'Number 3:'.

### Device login

- Username and Password used for GUI and AT over IP. By default, the username and password are "admin/admin".

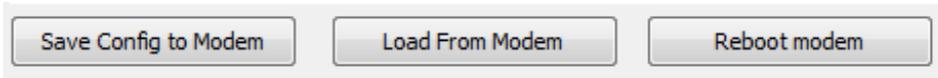
### System log

- Enable/disable saving the system logs in the internal memory
- Enable/disable the remote log function that sends the system log to a remote UDP server
- Enter the IP address and port number of the remote UDP server using the format of x.x.x.x:port. The default port number is 3333. If no port number is defined, the modem will keep the port already saved in the configuration.

### Administrators

- Allow up to three administrator phone numbers
- Administrators phone numbers in international format +61412 345 678
- When added, only these phone numbers can be used for Intelimax LITE specific SMS commands, such as RSSI and Reboot

## Save and Apply Configurations



### *Save Config to Modem*

When the modem configuration is changed via the GUI, users have to click the button to save the changes so that they will not be lost after reboot. It is recommended that users do a save on every change made as the GUI reloads the status every 15 seconds.

### *Load from Modem*

In addition to periodical reload, users can also use this button to load the modem status and configuration manually.

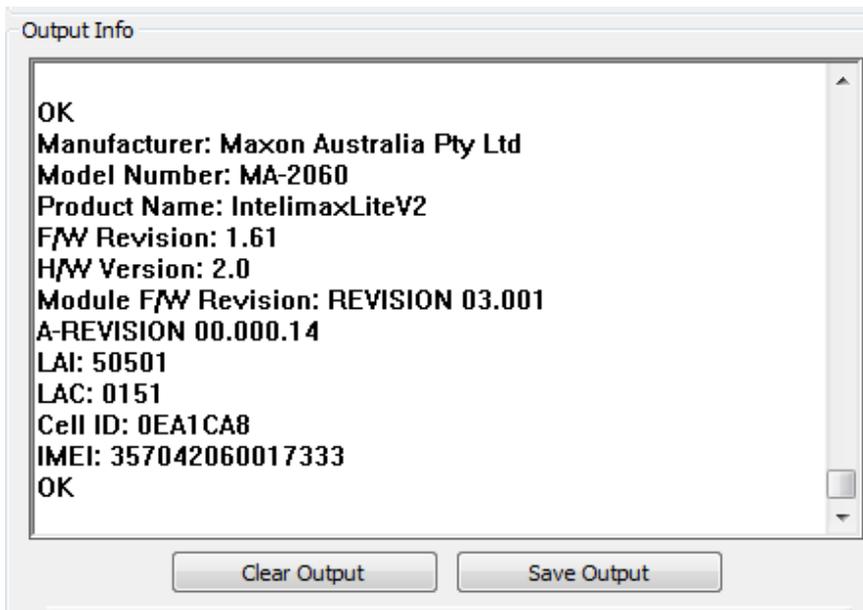
### *Reboot Modem*

By clicking the button, the modem will reboot.

Reboot is required in most cases for the configuration changes to take effect.

## System Information and Functions

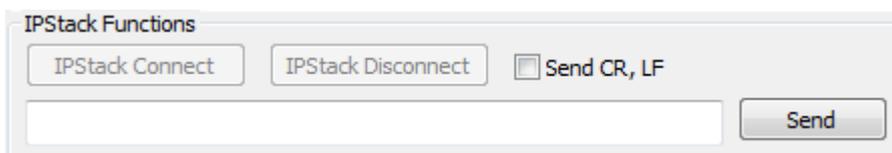
### *Output Info*



The Output Information provides connection information to the Intelimax LITE over either COM port or IP WAN. The output information can be cleared or saved to a text file by the provided two buttons.

### *IP Stack Functions*

This is to provide a convenient way to send IP Stack related AT commands to the COM port via GUI. This function is currently not supported.



### **IP Stack Connect AT Command**

AT+\$IPCTOS

### IP Stack Disconnect AT Command

AT\$\$IPCTCS

### IP Stack Connect Button

When IP Stack is Manual Mode, connect without AT Command input.

### IP Stack Disconnect Button

When IP Stack is manual mode, disconnect without AT Command input.

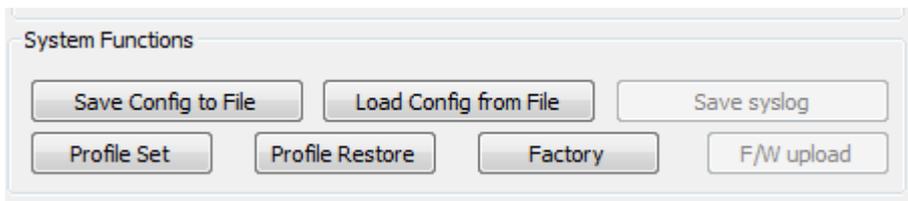
### Send CR, LF

Add Carriage Return and Line Feed message when data is sent. Use for AT Command sending via the GUI.

### Send Button

Send AT Command and Data.

## System Functions



### Save Config to File

Save modem configuration to an encrypted file for future use. Please pay extra attention to the passwords in the configuration. Because the password saved in the modem cannot be read back, they cannot be saved to a configuration file. If the user wants to save a modem's configuration to a file for future use, the user can load the configuration from the modem and re-enter the password in the password fields and then save the configuration to a file.

### Load Config from File

Load modem configuration from a saved file.

### Profile Set

The Intelimax LITE supports one saved customer profile so that users can later re-use the configuration. By clicking "Set Profile", modem will save the current modem configuration to a Profile stored internally.

### Profile Restore

Restore the saved Profile to the modem. After clicking this button, the modem will load the internally saved profile and reboot for the configuration to take effect. Profile restore can also be done by holding modem reset button for more than 5 seconds but less than 20 seconds. Both LED will blinking for a short time indicating the reset button is pressed more than 5 seconds.

### Factory Setting

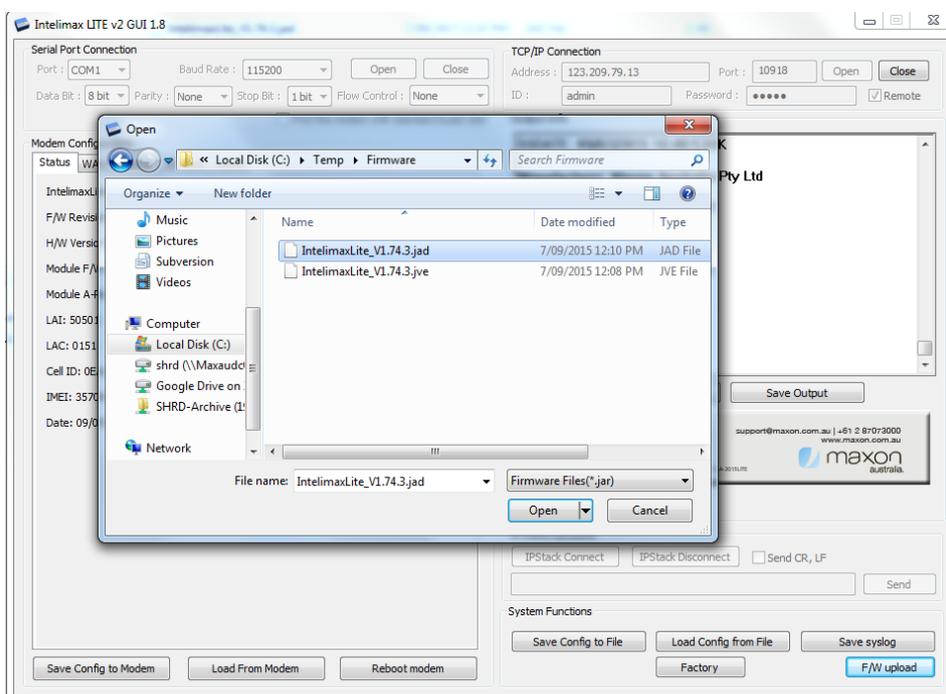
Restore factory settings to the modem. Factory reset can also be done by holding modem reset button for more than 20 seconds. Again, both LED will blinking for a short time indicating the reset button is pressed more than 20 seconds. This will also wipe the profile back to defaults.

# Firmware Upgrade

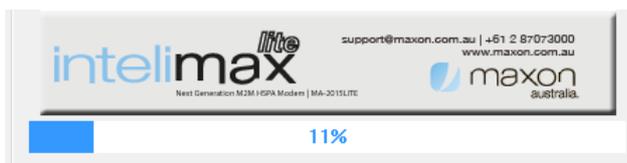
Intelimax LITE supports firmware upgrade either locally or remotely. A .jad file along with a .jve file is required for the firmware upgrade.

## Remote firmware upgrade (FOTA)

Remote firmware upgrade is achievable via the GUI using a remote connection to the Intelimax LITE when connected in an IP mode. The modem WAN IP address can be obtained with the SMS INTELIMAX.PARK.WANIP.



To Upgrade the Intelimax LITE’s firmware, click the ‘F/W Upload’ button and select the firmware file with the .jad suffix and open the file, the uploading screen will then appear:



Do not remove Intelimax LITE’s cable or turn off the power while upgrading. The process will usually take 3~4 minutes depending on network conditions.

## Local firmware upgrade

Local firmware upgrades can be achieved by following the steps below. You will only need to do step 1, 3, and 4 once on the same PC.

1. Install Cinterion MES software.
2. Connect modem to PC using USB port and the modem will powered up via USB.
3. Install Cinterion EHS6 module USB driver if required.

After the USB driver is properly installed, the EHS6 USB will enumerate 6 USB Com ports and a modem port. Ensure that these ports are below 100 by using the Windows Device Manager. If not, then modify by right clicking 'Properties', 'Port Settings', 'Advanced', then select one of the new 'COM Port Number' then apply all the settings by clicking 'OK'.

4. Open the Windows Explorer, click on 'Computer', and under the 'Other' tab.

The module drive  should be present. Right click on the 'Module', and select 'Properties', choose the COM port associated with the Cinterion EHx USB Com Port4, as listed under Device Manager, then click 'Apply'

5. Once the module drive is configured properly, the module drive can be opened by double clicking the module icon and then the A drive. You are able to see a few files in the drive.
6. You can now copy the provided .jad and .jve files to the module drive, as normal under Windows Explorer.
7. After the files are copied, close the Windows Explorer window and then disconnect the modem from USB port.
8. After 3 seconds, re-power the modem by USB cable. The modem will automatically perform firmware upgrade when new firmware files are found in the module drive. The upgrade process will take 2~3 minutes with one automatic reboot by modem itself. Do not remove Intelimax LITE's cable or turn off the power while upgrading.

## System Recovery

Although it is rare, there may be a chance of failure during the firmware upgrade process, either locally or remotely. Intelimax LITE has an in-built recovery mechanism so that the modem can run a recovery firmware in case of a failed firmware upgrade. The recovery firmware image is stored locally and operates very similar to the normal firmware, and will use the modem configuration that is active before the firmware upgrade.

To check whether the modem is running on recovery firmware, use the GUI to connect to the modem (locally or remotely) at least 5 minutes after firmware upgrade (it will take a few minutes for the modem to recover from a failed upgrade process). If the firmware version shown in the GUI is 1.0.X, the modem is running recovery firmware.

You can do normal firmware upgrade when modem is running the recovery firmware and a successful upgrade process will restore the modem back to running the normal firmware. If the modem keeps on running the recovery firmware after more than two firmware upgrade attempts, please contact Maxon Australia support.

## SMS COMMANDS

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The Intelimax LITE supports SMS commands for remotely checking modem status and changing certain configurations. The commands can be sent when the modem is locally in SMS text mode only (as opposed to PDU mode).

### SMS Commands in IP Stack Modes

Following SMS commands can be used to change the APN, ID, Password, Authentication and even reboot the Intelimax LITE. After changing the APN, ID, Password, Authentication, the Intelimax LITE will send a confirmation SMS after applying the changes.

- Change APN (e.g. telstra.extranet)  
**SMS Syntax:** INTELIMAX.PARK.APN telstra.extranet
- Change Username, Password and Authentication (e.g. Username: [maxon@maxon.com.au](mailto:maxon@maxon.com.au), Password: maxon, Authentication: chap)  
**SMS Syntax:** INTELIMAX.PARK.AUTH [maxon@maxon.com.au](mailto:maxon@maxon.com.au):maxon:chap
- Check WAN Settings and IP address  
**SMS Syntax:** INTELIMAX.PARK.WANIP

### SMS Commands in All Modes

The Reboot and RSSI Intelimax LITE SMS commands can be used to reboot the modem when in serial modem mode.

- Reboot Intelimax  
**SMS Syntax:** INTELIMAX.PARK.REBOOT

- RSSI Info

**SMS Syntax:** INTELIMAX.PARK.RSSI

- Change mode via SMS

The Modem mode can be changed by remote SMS using the CHGMODE command:

**SMS Syntax:** INTELIMAX.PARK.CHGMODE n

n :     1 – IPStack Auto  
          2 – IPStack Manual  
          3 – OutStation  
          4 – Serial Modem

**IMPORTANT:**

Modem firmware requires +CNMI=2,1 settings for getting notified when new SMS is available. Due to cellular module's behaviour on +CNMI command, any +CNMI write command via the modem serial port would break the modem SMS command function and the change cannot be saved if modem reboots. So please be cautious in using the AT+CNMI write command over the serial port.

# REMOTE CHANGE FROM CSD MODE TO IP MODE

---

The Intelimax LITE has the unique in-built feature of being able to change between modes and configure settings remotely over a CSD call (currently supported in Outstation mode not Serial Modem Mode). This is especially useful if you have a modem in the field that you need to remotely configure using remote AT commands or the Intelimax LITE GUI but are currently using CSD to talk to this modem. Using these commands lets you change to an IP connection for easy access to the device over an IP connection.

It is very important to ensure that you can access your modem once this is done which means either using a static IP address (private IP WAN or similar) or a public dynamic IP address such as telstra.extranet, the WAN IP of which can be found via SMS.

## Dialling Process

Dial out to the modem via a command line terminal session to your data modem using the data number of the SIM card in the Intelimax LITE. The string will be as follows: ATDT0400123456. Once the 'CONNECT' message has been displayed the modem is connected.

## Intelimax Remote Configuration Commands

The following commands can be used to change the settings of the Intelimax LITE. Before the following command can be interpreted, user need to send quickly \*\*\* in a row.

### Unlock the CSD programming interface:

```
program.maxon.unlock=admin:admin
```

admin:admin are the default username and password, if you have changed these update this command with the appropriate values in the order username:password.

**Update the cellular APN:**

```
program.maxon.apn=telstra.extranet
```

**Update the APN username, password and authentication:**

```
program.maxon.auth=userid:password:chap/pap/none
```

**Change the mode of the modem:**

```
program.maxon.mode=n
```

Where n:

- 1: IP Stack Auto mode – auto connect IP
- 2: IP Stack Manual mode – manual connect IP

**Apply all the settings and reboot:**

```
program.maxon.lock
```

Once the commands have been received by the modem the user must change back to data mode using the command 'ATO' then drop the CSD connection to the modem to initiate the mode change process:



```
COM58 - PuTTY
CONNECT
UNLOCK program mode
APN telstra.extranet, Profile 3
Userid: userid, Password: password, Authentication 2
Mode 1
Modem will reboot now.
```

Once the modem reboots (approximately 2 minutes) and a public dynamic IP address has been used, it can be found using the following SMS to the phone number (not data number) of the SIM in the modem: INTELIMAX.PARK.WANIP

## LED FUNCTIONALITY

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The Power/RSSI LEDs will be ON when powered, and both PWR/RSSI and DATA LEDs will blink for a short time under following scenarios:

1. After boot up
2. Reset button is held for more than 5 seconds, and
3. Reset button is held for more than 20 seconds

During normal operation, the PWR/RSSI and DATA LEDs will show the status as per the tables below:

Signal Strength	PWR/RSSI LED
SIGNAL > -84dBm	SOLID ON
-89dBm < SIGNAL ≤ -84dBm	800ms ON 200ms OFF
-96dBm < SIGNAL ≤ -89dBm	600ms ON 400ms OFF
-101dBm < SIGNAL ≤ -96dBm	400ms ON 600ms OFF
SIGNAL ≤ -101dBm	200ms ON 800ms OFF
SIM Not Registered	400ms ON 600ms OFF

Connection Status	Data LED
IP STACK IDLE SERIAL MODEM IDLE	OFF
IP STACK ONLINE SERIAL MODEM CONNECTED	1s ON 1s OFF

# MODEM DEBUGGING

---

## Local Connection Checking

In order to verify that the modem is operating correctly locally, follow the below steps:

1. Check that modem Power LED is either solid on or mostly on. The better the signal strength the more time the Power LED will stay on.
2. In Serial Modem mode:
  - a. Connect to modem with GUI via RS232 interface and check the registration and signal strength of the modem. The status page will show whether the modem is currently registered as well as showing the signal level in dBm, which should be better than -93dBm.
  - b. Trigger a connection through the modem (either CSD or PPP connection) and ensure that the data light will correctly blinking to indicate data transfer through modem.
3. In IP Stack Auto mode:
  - a. Connect to modem with GUI via RS232 interface and check the registration and signal strength of the modem. The status page will show whether the modem is currently registered as well as showing the signal level in dBm, good levels are better than -81dBm.
  - b. Ensure that the modem has a data connection which should be automatically set up by the modem. If the data LED is blinking then this connection has been established.
4. In both modes:
  - a. Connect to the modem using the USB interface and install the EHS6 module drivers if required.
  - b. Open Windows device manager, check which COM port is matched to EHS6 USB COM Port3 and open a terminal connection to the COM port.
  - c. Once connected you can check the following via AT commands:
    - i. AT+CSQ to check signal strength is better than -81 dBm
    - ii. AT+CREG to check that the modem is registered, the response should be +CREG: 0,1.

## Remote Connection Checking

In order to verify that the modem is correctly operating when the modem is remotely located, please follow the below steps:

1. In serial modem mode with CSD connection, dial into the modem data number:
  - a. If the response is 'BUSY' then the SIM card is not correctly provisioned.
  - b. If the response is 'NO CARRIER' immediately then the SIM card is offline and not registered.
  - c. If the response is 'NO CARRIER' after some time, then the modem auto answer is not working correctly but the SIM card is registered.
  - d. If you are able to connect to the modem (response is 'CONNECT', then you can remotely check the settings on the modem by changing to an IP mode and making a connection to the modem using the configuration GUI.
2. In IP Stack modes:

Open the GUI with an IP connection to the modem and log in.

  - i. Check that the settings are correct for the equipment that you are wanting to connect to, including the serial baud rate, etc.
  - ii. Check that the signal strength is of a good level, better than -81 dBm.
3. In either mode, send diagnostic SMS commands to the modem as below:
  - a. Check RSSI: By sending INTELIMAX.PARK.RSSI to the modem, the modem will respond with the RSSI which should be better than -81dBm.
  - b. Check APN and WAN connection using: INTELIMAX.PARK.WANIP. The response is: "IP:<IP.IP.IP.IP>,APN:<APN>,ID:<ID>,PW:<PW>,Auth:<PAP,CHAP,BOTH>,Reg:<0,1>,Sig:<CSQ>"
  - c. If neither command work, then reboot the modem using: INTELIMAX.PARK.REBOOT

# EXTENDED / INTELIMAXLITE SPECIFIC AT COMMAND SET (IP STACK MODES)

---

## Device Information

### ATI

Manufacturer: Maxon Australia Pty Ltd

Model Number: MA-2060

Product Name: IntelimaxLiteV2

F/W Revision: 1.75

H/W Version: 2.0

Module F/W Revision: 03.001

Module A-Revision: 00.000.14

LAI: 50501

LAC: 0151

Cell ID: 0EA1CA8

IMEI: 357042060021269

OK

### AT+CGMI

Maxon Australia Pty Ltd

### AT+CGMR – Firmware version

+CGMR: 1.0.5 [201409230653]

### AT+CGSN – IMEI number

354283049080793

## WAN extension function

### AT\$\$WANSE?

\$\$WANSE:

PINGCHECK:Enable,0,0,0.0.0.0,

BACKOFF:Disable,0,0,0,0

OK

**Parameters**

\$\$WANSE: X,X,X,X,X,X

0,1 PINGCHECK,BACKOFF

0,1 Disable/Enable both expansion PINGCHECK and BACKOFF

1~60 Interval of PINGCHECK/40~59 Seconds of 1st retrial interval of BACKOFF

1~60 Fail count of PINGCHECK/2~10 Minutes of 1st retrial duration of BACKOFF

IP address of 1st server of PINGCHECK/10~59 Minutes of 2nd retrial interval of BACKOFF

IP address of 2nd server of PINGCHECK/2~10 Hours of 2nd retrial duration of BACKOFF

OK

**WAN authentication****AT\$\$WANSA?**

\$\$WANSA: 1,telstra.extranet,0,,, \*99#,0,,0,0,0,0,00:00,0

OK

**Parameters**

\$\$WANSA: X,X,X,X,X,X,X,X,X,X,X,X,X,X,X,X

1,2,3,4 IPStack Auto/Manual/Outstation/Serial mode

Access Point Domain Name

0,1,2 NONE/PAP/CHAP

Username

Password

Dialup number

0,1 Auto PIN Disable/Enable (Not supported)

PIN code (Not supported)

0 ~ 26 Hours of Periodic reset

0,1 Disable/Enable Reset (TCP Server Listening) – Server – If enabled will wait until client drops connection

0,1 Disable/Enable Reset (TCP Connected State) – Client – If enabled will wait until Intelimax client drops connection to a server or server drops connection

0,1 Disable/Enable Reset at scheduled Time (Not supported)

HH:MM for Reset at scheduled Time (Not supported)

Battery Level for Module Deregistration (12.3 volts ON, 11.9 volts OFF) (Not supported)

OK

**Note:** The Dialup Number cannot be left blank.

## IP Stack setting

### AT\$\$WANSI?

\$\$WANSI: 1,1,1,0,0.0.0.0,0.0.0.0,30000,1,300,20,0,0

OK

### Parameters

\$\$WANSI: X,X,X,X,X,X,X,X,X,X,X

0, 1,2 None/Server/Client

0,1 Disable/Enable Notify Boot Message

0,1 Disable/Enable Notify IPStack Message

0,1 TCP/UDP

xxx.xxx.xxx.xxx Primary IPAddress

xxx.xxx.xxx.xxx Secondary IPAddress

0 ~ 65535 Port Number

0,1 Disable/Enable Idle Timeout

1 ~ 3600 Seconds Idle Timeout

5 ~ 60 Seconds Network Dormant Period UDP (Not supported)

0,1 Disable/Enable UDP Keep Alive (Not supported)

0,1,2 ~ 60 Disable/Handshake/Seconds UDP Wake Up (Not supported)

OK

## System

### AT\$\$SYSTS?

\$\$SYSTS:

admin,admin,Enable,23,Enable,Disable,192.168.0.50,Disable,+61427933242,+6142793324

2,+61427933242

OK

### Parameters

\$\$SYSTS: X,X,X,X,X,X,X,X,X,X,X

UserName

Password

0,1 Telnet Disable/Enable

Telnet Port Number

0,1 Syslog Disable/Enable

0,1 Remote syslog Disable/Enable

Remote syslog server address

0,1 SSH Disable/Enable

Phone number of Administrator

Phone number of Administrator

Phone number of Administrator

OK

## Serial (UART) port

**AT\$\$SPORT?**

\$\$SPORT: 115200,8,N,1,None,0,1

OK

### Parameters

\$\$SPORT: X,X,X,X,X,X,X

1200,2400,4800,9600,19200,38400,57600,115200 Baud rate

8 Data bits

N None Parity

1 Stop bits

None, Hardware Flow control

0 Don't Care

0,1 Half, Full Duplex (RS485 Option Only)

OK

## Engine Band

**AT\$\$BAND?**

\$\$BAND: 40000000

OK

**Parameters**

\$\$BAND:

1: GSM 850

2: GSM DCS 1800

4: GSM EGSM 900

20: GSM PCS 1900

40: WCDMA I 2100

80: WCDMA II 1900

400: WCDMA V 850

800: WCDMA VI 800

1000: WCDMA VIII 900

40000000: AUTO

OK

**Examples:**

/ GSM 850/900/1800/1900

AT\$\$BAND=3f

\$\$BAND: 0000003f

OK

**Note:** At least one GSM and one WCDMA band must be selected. If no band is selected in GSM or WCDMA, GSM900 or WCDMA2100 will be automatically added. **The modem has to be power cycled after any band change.**

**Check WAN IP address**

**AT\$\$WAN**

\$\$WAN: 123.209.0.204

OK

**Signal Strength**

**AT+CSQ?**

+CSQ: 17,99

OK

### Open PPP connection

**AT\$\$IPCTOP**

### Close PPP connection

**AT\$\$IPCTCP**

### Open TCP/UDP Socket

**AT\$\$IPCTOS**

### Close TCP/UDP Socket

**AT\$\$IPCTCS**

### Change Remote Server IP address

**AT\$\$IPCTRIP=0,ip,ad,dr,ess,<port>**

**Example:** AT\$\$IPCTRIP=0,123,456,789,01,30000

### Change client/server mode

**AT\$\$IPCFL=4,<0,1> where 0 for server, 1 for client**

**Example:** AT\$\$IPCFL=4,0 sets modem to server mode

### IPStack Connection Settings

**AT\$\$IPSCFG?**

\$\$IPSCFG: 30,100,300

OK

AT\$\$IPSCFG=?

\$\$IPSCFG: X,X,X

IPSTACK SEND DELAY: 1 ~ 2000 msec

IPSTACK BUFFER SIZE: 32 ~ 1450 bytes  
IPSTACK SOCKET TIMEOUT: <0,10~3600> sec  
PPP DISCONNECT TIMEOUT: <0,30~3600> sec  
OK  
AT\$\$IPSCFG=30,100,200,301  
OK  
AT\$\$IPSCFG?  
\$\$IPSCFG: 30,100,200,301  
OK

### Change modem mode

**AT\$\$CHGMODE=**

- 1 – IP Stack Auto
- 2 – IP Stack Manual
- 3 - OutStation
- 4 –Serial Modem

AT\$\$CHGMODE=1  
OK

### Change Periodic Reset Settings

**AT\$\$RESET=<num>**

<num>  
OK

<num>: 0 ~ 26 hours. Periodic Reset is disabled if "0".

### Modem Reboot

**AT\$\$RESET**

OK

## Factory Reset

### **AT\$\$FACTORY**

```
AT$$FACTORY
```

```
OK
```

## AT over IP Authentication

### **AT\$\$UNLOCK**

This command is only required for AT over IP access. User can send AT command to the modem via TCP connection and the command is to add a level of security over the remote access to the modem. The port dedicated to the modem AT over IP function is 10918. The modem GUI software uses the same way to communication with modem via TCP. To unlock the AT over IP access, use the following command:

```
AT$$UNLOCK=userid:password
```

```
AT Command Set is accessible now!
```

```
OK
```

By default, both the userid and password is admin.

## Prepare modem for hard shutdown

### **AT\$\$RTD**

This function is required when using the modem with an external controlled power supply. If the modem is going to have its power dropped regularly, this AT command allows for the processor to perform housekeeping duties to ensure that the shutdown process does not damage the modem or internal cellular module.

```
AT$$RTD
```

```
$$RTD: 1
```

```
OK
```

The modem will shut itself down in about three (3) seconds after receiving the command and is then ready for cutting of the power. Please note that, if the modem is powered off after issuing the AT\$RTD command, please leave the modem unpowered for at least 3 seconds before re-applying the power.

## EXTENDED / MODEM SPECIFIC AT COMMAND SET

---

### Modem Config

Parameter	Description	
[E0]	Do not echo command set in command state or online command state.	
E1	Echo command set in command state or online command state.	
[Q0]	Return result codes.	
Q1	Do not return result codes.	
[&C0]	DCD line always ON.	
&C1	DCD line is ON during a circuit switched call. In IP Stack mode, the behaviour is like &C0.	
&C2	DCD line is normally ON and will toggle OFF for 1 second when the circuit switched call is disconnected. In IP Stack mode, the behaviour is like &C0.	
&C3	DCD line is normally OFF and will be ON when modem has successfully established a PPP Data (packet switched) call (only applies to IP STACK mode). In Outstation mode, the behaviour is like &C0.	
&C4	DCD line is normally OFF and will be ON when modem has successfully established a PPP Data call and opened a socket connection with remote client/server (only applies to IP STACK mode). In Outstation mode, the behaviour is like &C0.	
[&D0]	Ignore DTR line signal.	
&D1	Enter online command state following ON-to-OFF transition of DTR line while retaining the data connection.	
&D2	ON-to-OFF transition of DTR line will disconnect the data connection (only applies to Serial Modem mode) and change to command mode. During OFF state of the DTR line, the auto-answer function (see S0) is disabled. In IP Stack mode, the behaviour is like &D1.	
S0	[2], <1 to 255> 0	Automatic answering. [Enable automatic answering after (Value) x 6 seconds.] 0: No auto- answering

#### Note:

1. [ ] indicates default value.
2. The settings of &C2 has no effect in Serial Modem mode and DCD line will remain OFF.
3. The settings of &C3 and &C4 are not supported in Serial Modem mode.

### Initiate a Data Call

<b>Command</b>	<b>TE2</b>	<b>→</b>	<b>MT2</b>	
<b>Command</b>	TE2	→	MT2	ATD<phone_number>
<b>Notify</b>	TE2	←	MT2	CONNECT (Data call connected) Connect <Speed> if connect_baud is set. NO CARRIER (Data call failure)
<b>Value</b>	phone_number: for Packet Switched Data: *99# (Australia – requires authentication) for Circuit Switched Data: You will need a data number ( Code 2620 activated on the SIM account)			

### Answer an Incoming Data Call

<b>Notify</b>	<b>TE2</b>	<b>←</b>	<b>MT2</b>	<b>AT: RING</b>
<b>Command</b>	TE2	→	MT2	ATA (answer data call)
<b>Notify</b>	TE2	←	MT2	CONNECT (Data call connected) CONNECT <SPEED> if connect baud is enabled. NO CARRIER (Data call failure)
<b>Call State</b>				
<b>Command</b>	TE2	→	MT2	+++ (escape command to go to on-line command state) ATH (release call)
<b>Notify</b>	TE2	←	MT2	NO CARRIER

### Save & Reboot

AT&W

Saves AT commands

AT+CFUN=1,1

Reboot the modem

### Getting S0 value in serial modem mode

Please use AT\$S0? Command to get the S0 value. AT&V command will give you incorrect S0 Value:

AT\$S0=2

OK

AT\$S0?

2

OK

## Single SMS AT command

**This command is NOT available in Serial Modem Mode**

**AT+MMC SMSMO <Phone number> <message><CR>**

Example: AT+MMC SMSMO 0400123456 Boiler Temperature Too High!<CR>

Maximum length of message is 160 characters.

Some characters are not supported: \, [, ], ^, ~, `

## Prepare modem for hard shutdown

**AT\$\$RTD**

This function is highly recommended when using the modem with an external controlled power supply. If the modem is going to have its power dropped regularly this AT command allows for the processor to perform housekeeping duties to ensure that the shutdown process does not damage the modem or internal cellular module.

AT\$\$RTD

OK

The command is only valid when in IP and Outstation mode. If using the modem in serial modem mode, please deregister the modem from the network using the following commands before removing the power:

AT+CGATT=0

AT+COPS=2

AT+CFUN=4