LAN Modem

XM1630S

Software Reference Manual

Version 104

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1. INTRODUCTION

1.1 OVERVIEW

This manual describes the commands and the configuration for the following xmodus swiss GmbH Socket Modem families:

AL6000SS	LAN Socket Modem (5V Version)
AL6000S-3V	LAN Socket Modem (3V Version)

The description applies to all these LAN-modems without any differences between product families noted. Please refer to Modem Firmware Release notes for commands applicable to the modem firmware.

1.2 PRODUCT DESCRIPTION

The xmodus AL6000S and AL6000S-3V Socket Modem Family provides the OEM with a complete LAN data modem in a compact socket-mountable module. This module enables any devices to send and receive data over the Ethernet network. The IEEE 802.3u interface with auto-negotiation and auto-crossover is supported. The module is fully approved and homologated and conforms to the CE regulations. This gives fastest time-to-market to LAN-enable any devices.

The compact size and high level of integration of the Socket Modem minimizes real estate and cost for motherboard and box modem applications. Its low power consumption makes it ideal for a wide variety of embedded control applications. The pin compatibility between the full range of Analog Series Socket Modems, ISDN, GSM and LAN Socket Modems allows upgrading and production configurability without hardware changes.

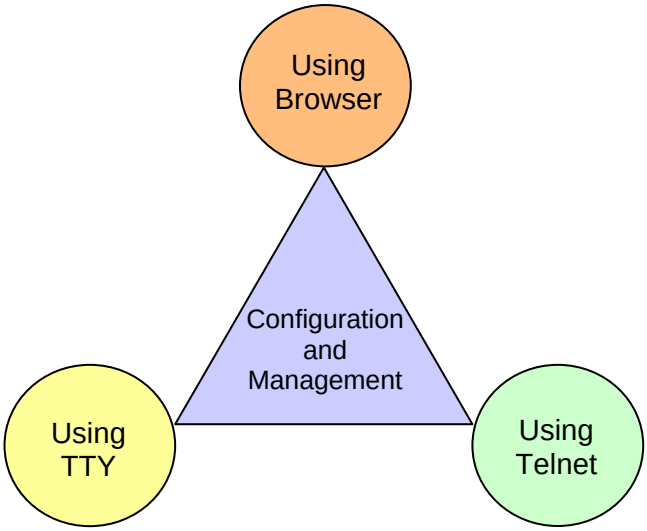
As a data modem, the AL6000S Socket Modem can send and receive data at speeds up to 230’000 bps in transparent or Telnet modes. Protocols such as TCP/IP, UDP, ARP, ICMP and DHCP are supported.

The very flexible IP protocol stack allows easy integration of user applications such as additional bus systems (CAN) or serial protocols for automation systems.

Optional interfaces like SPI, USB or CAN are integrated for future expansion. The standard modules support configurable I/O ports and ADC ports for monitoring and control.

2. MANAGEMENT AND CONFIGURATION

The modem provides 3 different ways for configuration and management.



2.1 Login with Web Browser

When using the web browser to configure your LAN-modem for the first time, use the default IP address of the modem: **192.168.1.3**

At the login prompt, type: "**ADMIN**"

At the password prompt type: "**AL6000S**"

(The user name and password are case sensitive)

2.2 Login with Telnet Client

When using Telnet client to configure your LAN-modem for the first time, use the default IP address of the modem: **192.168.1.3**

→ At the login prompt, type: "**ADMIN:AL6000S**"

(The user name and password are case sensitive)

2.3 Login with TTY

When using TTY to configure your LAN-modem, you must configure the serial port to the default serial configuration of the module.

115200 bps, 8-bit, no parity, 1 stop bit

→ **No authentication needed for TTY configuration.**

→ Press 3 x Enter to arrive at the login prompt.

2.4 General information

- The OK or "#" sign designates the prompt in command mode.
- No prompt is displayed in data mode.
- To end your configuration session type "quit".
- To display a list of available menus type "help".

3. WEB BASED CONFIGURATION

The AL6000S LAN-modem consists of a HTTP Web server, which allows configuration and monitoring through any common web browser. When using your web browser to configure your LAN-modem for the first time, use the default IP address of the modem:

192.168.1.3

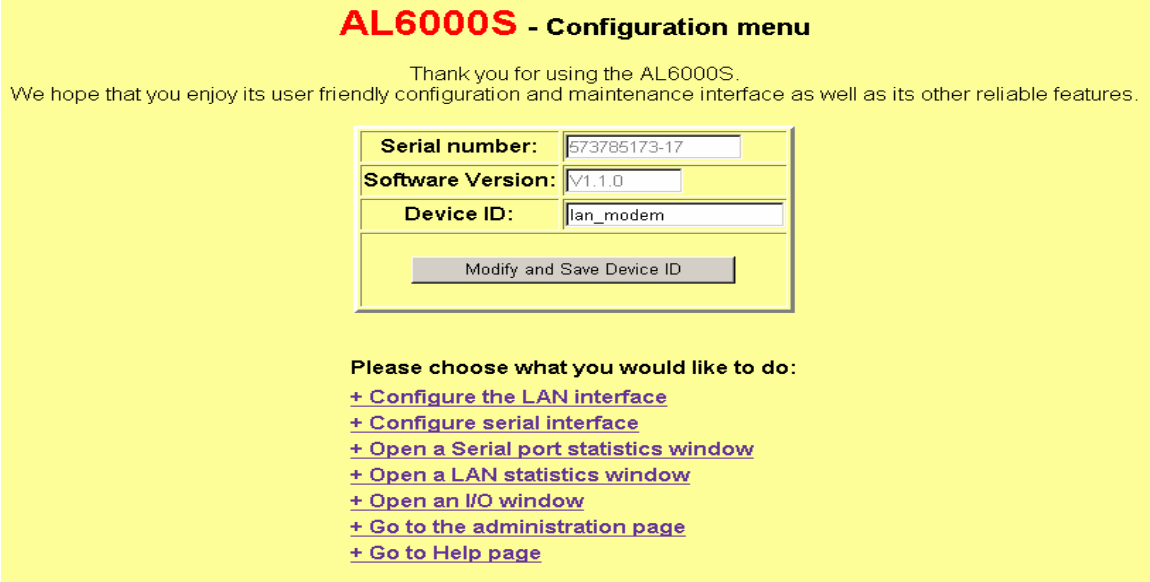
At the login prompt, type: "**ADMIN**"

At the password prompt type: "**AL6000S**"

(The user name and password are case sensitive)

After login, the following entry screen should display:

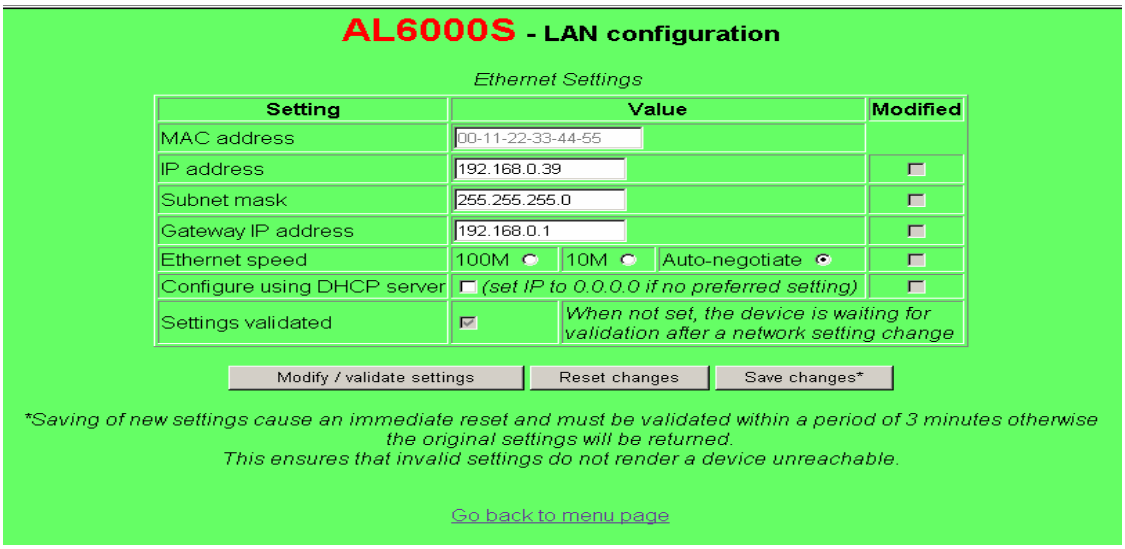
Main configuration screen:



3.1 Web based LAN configuration

The LAN Configuration Screen allows configuration of all the LAN specific parameters such as IP address, subnet mask, gateway IP address, Ethernet speed and DHCP server.

LAN configuration screen:



Important:

The LAN configuration menu contains a validation procedure, which prevents the storing of incorrect configuration data. After a setting has been changed and saved, the new configuration must be validated within 3 minutes by reconnecting via the Browser and clicking on the <Modify / validate settings> button. After this timeout with no validation, the module returns to the previous configuration so that it cannot be left in an unreachable condition.

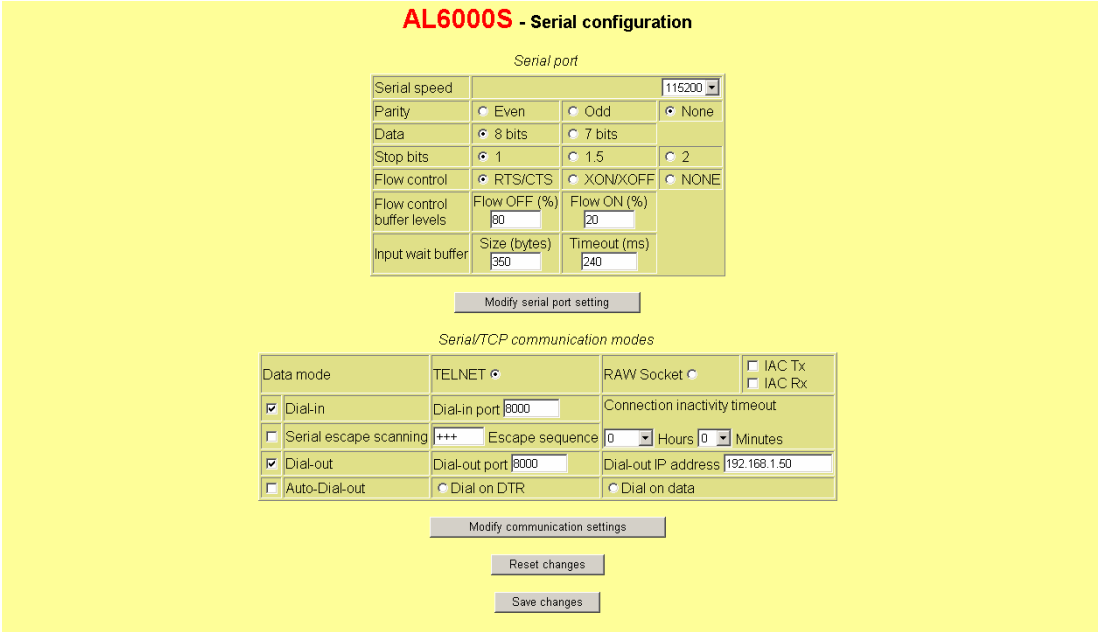
Procedure:

→ Change settings as desired
→ Click on <Modify/validate settings> followed by <Save changes*>
→ The LAN modem will now reboot with its new settings. Reconnect using the new settings to ensure that it is reachable.
→ Click on <Modify/validate settings> to validate the new settings so that they are permanently used.
→ If after 3 minutes no validation has taken place the previous configuration is automatically restored.

3.2 Web based serial configuration

The serial configuration screen provides all the settings for the serial interface and the serial communication modes.

SERIAL configuration screen:



3.2.1 Serial Port configuration:

- **Serial Port parameters**: setting of baud rate, parity, data-bits, stop-bits and flow-control.
- **Flow Control**: Selects between RTS/CTS (Hardware) flow control and XON/XOFF (Software) flow control. The high and low-water marks can also be modified.
- **Input wait buffer**: specifies the conditions at which the received data is packed in a TCP/IP frame and sent to the remote side. As default, received data is sent after 350 bytes (buffer full) or after 240 ms (if less than 350 bytes received).
- **Modify:** To make the settings active press the “Modify serial port” button. The new setting is immediately valid.
- **Save changes:** Permanently saves the new setting.

3.2.2 Communication modes:

- **TELNET:** The Telnet radio button enables the Telnet protocol for data communications. Communication is established through the specified port, which defaults to 8000.
- **RAW:** The RAW radio button enables transparent mode for data communications. Communication is established through the specified port, which defaults to 8000.
- **IAC:** The IAC-Tx and IAC-Rx radio buttons enables IAC byte-stuffing in the specified direction when in Raw communication mode.
- **Modify:** To make the settings active press the “Modify communication” button.
- **Save changes:** Permanently saves the new setting.

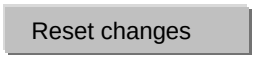
3.2.3 Serial/TCP Communication settings:

- **Dial-in:** The dial-in radio button enables TCP access from remote side to the LAN modem (incoming calls) and enables the modules Telnet data Server. The dial-in port specifies the port address of the Telnet data server (8000 default).
- **Dial-out:** The dial-out radio button enables Telnet access from the LAN modem to the remote side (outgoing calls) and enables the Telnet Client. The dial-out port specifies the port address of the Telnet client (8000 default) and the dial-out IP address the address of the server to be contacted.
- **Auto Dial-out:** The Auto dial-out radio button enables automatic Telnet access from the LAN modem to the remote side (automatic outgoing calls). The connection is automatically established by either the DTR line (DTR active) or by presence of data. This is selected by either the “Dial on DTR” or the “Dial on data” radio buttons.
- **Modify:** To make the settings active press the “Modify communication” button.
- **Save changes:** Permanently saves the new setting.

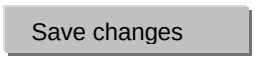
3.2.4 Serial Escape Scanning:

- **Serial Escape:** The Serial escape scanning radio button enables the escape to command mode function. The “Escape sequence” field specifies the characters used to switch from data to command mode.

3.2.5 General:



→ Reset all changes to default.

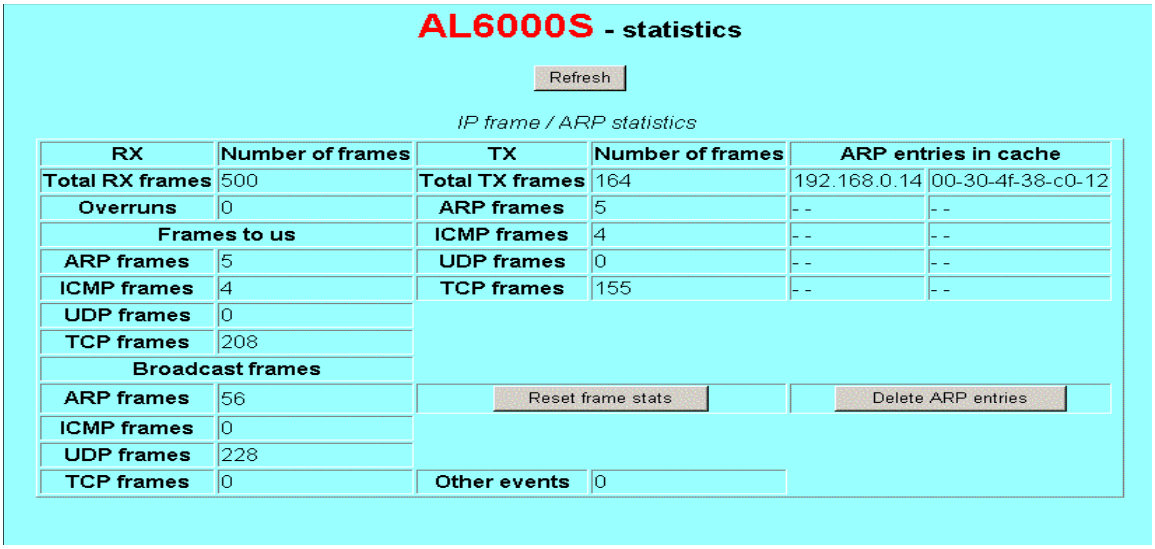


→ Make changes permanent.

3.3 Web based statistics

The statistics screen provides all the information regarding the packet (frame) oriented traffic on the Ethernet port. These statistics can be helpful to trace back specific processes.

Statistics screen:



AL6000S - statistics

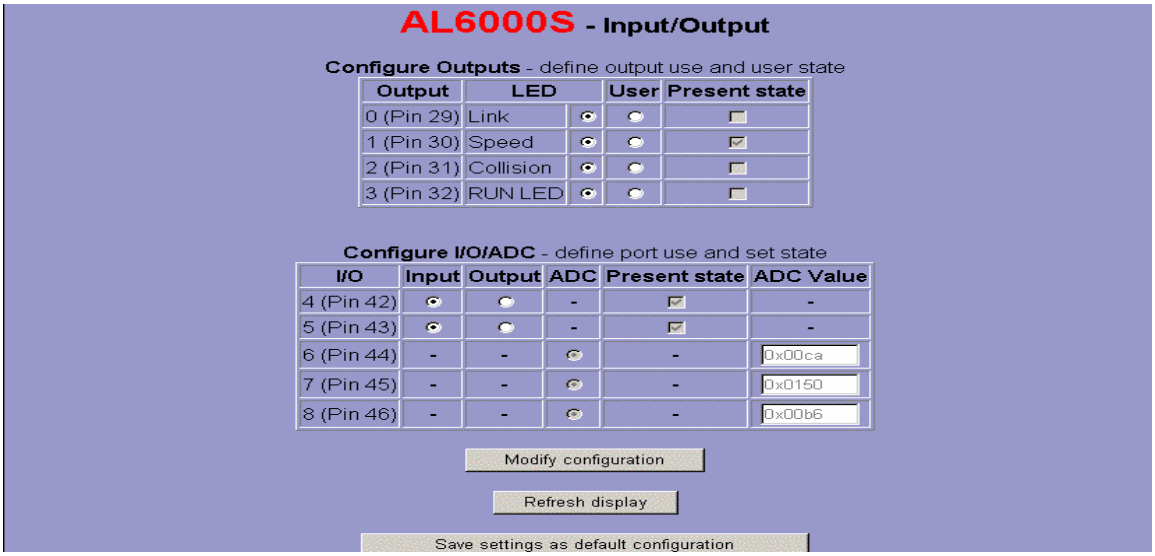
Refresh

IP frame / ARP statistics

RX	Number of frames	TX	Number of frames	ARP entries in cache	
Total RX frames	500	Total TX frames	164	192.168.0.14	00-30-4f-38-c0-12
Overruns	0	ARP frames	5	- -	- -
Frames to us		ICMP frames	4	- -	- -
ARP frames	5	UDP frames	0	- -	- -
ICMP frames	4	TCP frames	155	- -	- -
UDP frames	0				
TCP frames	208				
Broadcast frames					
ARP frames	56	Reset frame stats		Delete ARP entries	
ICMP frames	0				
UDP frames	228				
TCP frames	0	Other events	0		

3.4 Web based I/O configuration

The I/O configuration screen provides all the settings to configure the I/O and ADC ports plus the LED output lines. It allows read and write operations on predefined hardware ports.



3.4.1 Configure LED outputs:

- **Port 0:** This port is configurable as “Link” LED or user defined output by either the Link or the User radio button. The “present state” field shows the actual state of the port.
- **Port 1:** This port is configurable as “Speed” LED or user defined output by either the Link or the User radio button. The “present state” field shows the actual state of the port.
- **Port 2:** This port is configurable as “Collision” LED or user defined output by either the Link or the User radio button. The “present state” field shows the actual state of the port.
- **Port 3:** This port is configurable as “Run” LED or user defined output by either the Link or the User radio button. The “present state” field shows the actual state of the port.

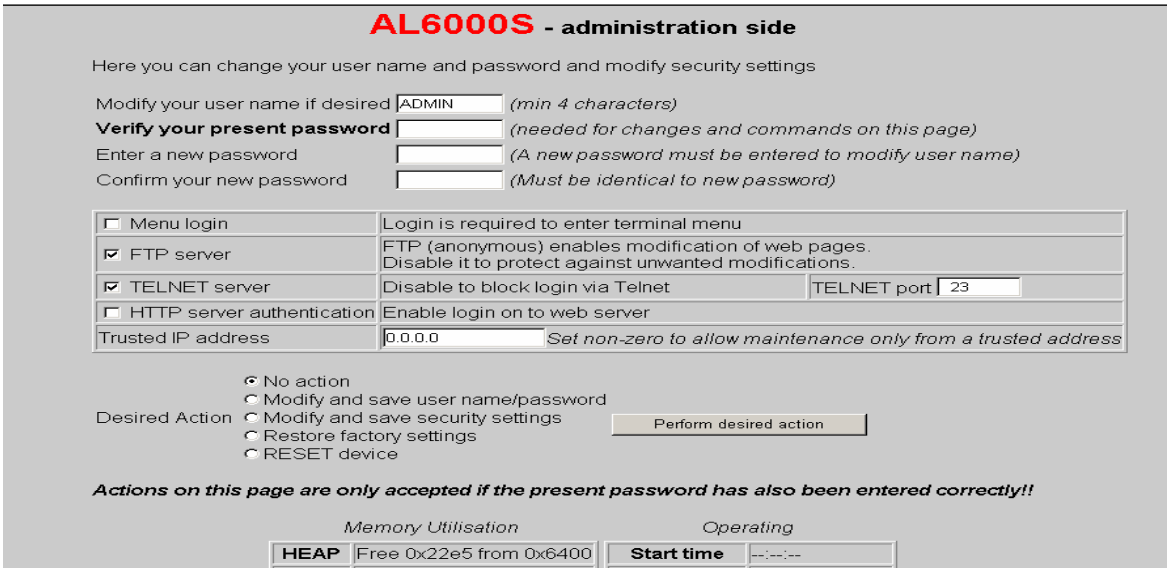
3.4.2 Configure I/O and ADC:

- **Port 4 – 8:** These ports are configurable as Input, Output or ADC ports by either the “Input”, “Output” or “ADC” radio buttons. The “present state” field shows the actual state of the port. The “ADC value” files shows the hexadecimal equivalent of the analog input level.

Refresh Display → Read new port values and ADC samples.

3.5 Web based administration

The administration screen provides the possibility to change the user name and the password of your module. Furthermore you will be able to configure the FTP, TELNET and HTTP servers.



Important:

Please pay attention that changes on this page are only accepted if the present password has been entered in the “Verify your present password” field.

- **Enter a new password:** This field allows entering a new password. It is validated by the “Confirm your new password” field. These fields must be identical.
- **Menu Login:** Select this radio button if a login is required to enter the terminal menu from a Telnet connection.
- **FTP Server:** This radio button defines if the FTP server of the module is accessible from the remote side. The FTP server enables modification of the web pages. Disable it to protect against unwanted modifications.
- **Telnet Server:** This radio button enables the Telnet server of the module. Disable it to block login via Telnet from remote site. The field “Telnet port” selects the port number of the server (default 23 – standard Telnet port number).
- **HTTP Server Login:** This radio button enables authentication so that the web server requests login on contact.
- **Trusted IP address:** If “Trusted IP address” field is set non-zero, only the specified IP address (trusted address) is allowed to login on to the module to perform configuration and monitoring. All other source addresses will be rejected.

4. COMMAND LINE INTERFACE

4.1 Syntax and procedures

The T.50 International Alphabet 5 (IA5) is used in this document. Only the low-order seven bits of each character are significant to the modem; any eight or higher-order bit(s), if present, are ignored for the purpose of identifying commands and parameters. Lower-case characters are considered identical for their upper-case equivalents when received by the modem from the DTE. Result codes from the modem are in upper-case.

4.1.1 DTE command lines

Words enclosed in <angle brackets> are referenced to syntactical elements. The brackets are not used when the words appear in a command line. Words enclosed in [square brackets] represent optional items, which may be omitted from the command line at the specified point. The square brackets are not used when the words appear in the command line. Other characters that appear in syntax descriptions must as included as shown.

4.1.2 Command line editing

The character <BS> is interpreted as a request from the DTE to the modem to delete the previous character.

4.1.3 Command line echo

The modem may echo characters received from the DTE during command state and online command state back to the DTE, depending on the setting of the ATEn command. If so enabled, characters received from the DTE are echoed in the same format as received.

4.1.4 Factory settings

The parameter settings of the modem are pre-configured by the factory defaults. These factory defaults can be reloaded at any time by using the “restore” command. The parameter settings will be changed when using any commands, which affect the configuration of the modem. This changes can be permanently stored by using the “save” command.

restore = Restore factory configuration.
save = Store current configuration.

4.1.5 Escape code sequence

When the modem has established a connection and has entered on-line data mode, it is possible to break into the data transmission in order to issue further commands to the modem in an on-line command mode. This is achieved by the DTE sending to the modem a sequence of three ASCII characters specified by set_esc command. The default character is '+'. The escape characters will be transmitted transparent to the remote side.

4.2 Summary of commands

LAN CONFIGURATION	
set_dhcp	<enable/disable> DHCP
set_ip_add	Set IP address
set_ip_mask	Set IP mask
set_ip_gway	Set the gateway
set_eth_speed	Set LAN speed (10/100/AUTO)
show_config	Show network configuration
show_config_o	Show original network config.
save	Save configuration
validate	Validate configuration
ping	Ping IP address
arp a	Request ARP table
arp –d	Delete ARP table
help	Display menu help
quit	Leave command mode
CONFIGURE SERIAL INTERFACE	
set_baud	Set serial baud rate
set_stop	Set stop bits (1/1.5/2)
set_bits	Set data bits (7/8)
set_par	Set parity (EVEN/ODD/NONE)
set_flow	Set flow control (XON/HW/None)
set_high water	Set flow stall [1..99%]
set_low_water	Set flow restart [1..99%]
set_buf_size	Set serial input buffer
set_buf_delay	Set serial input buffer delay
CONFIGURE SERIAL/TCP COMUNICATION	
set_raw _socket	Defines Telnet / RAW modes
set_iax_rx	Enable IAR Rx filtering
set_iac_tx	Enable IAC Rx filtering
set_socket_tout	Set Telnet session timeout
set_dialin	Enable dial-in (incoming call)
set_dialin_port	Def. dial-in port (incoming call)
set_esc	Enable escape to command mod.
set_dialin	Enable dial-in (incoming call)
set_dialout	Enable dial-out (outgoing call)
set_dialout_port	Def. dial-out port (outgoing call)
set_dialout_ip	Default IP address. for dial-out
set_auto	Enable Auto dial-out
set_auto_hw	Defines Auto dial-out trigger
Show_config	Show serial/TCP configuration

CONFIGURE INPUT/OUTPUT	
set_user	Set output mode of I/O ports
get_user	Get output mode of I/O ports
set_ddr	Set port type [i,o] of I/O ports
get_ddr	Get data direction of I/O ports
read_port	Read status of I/O ports
write_port	Set status of I/O ports
read_adc	Read ADC input value
ADMINISTRATION MENU	
set_pass	Define user name and password
set_id	Define ID name
reject	Reset non saved changes
restore	Restore factory default
reset	Reset non-saved setting
download	Download new firmware
CONFIGURE SECURITY	
set_ftp	Enable FTP Server
set_telnet	Enable Telnet Server
set_web	Enable HTTP (web) Server
set_web_auth	Enable web authorization
set_telnet_port	Define Telnet port
set_trusted_ip	Define trusted IP address
show_config	Show configuration
AT COMMANDS	
AT	Standard AT command
ATD	Dial out to IP address
ATO	Resume data session
ATH	Terminate connection
go AT	Go to AT command mode
up	Go to menu
help	Display help
quit	Leave command mode

4.3 Help screens

4.3.1 help<cr> → Display Main menu

```
AL6000S Main menu
==================
1                Configure LAN interface
2                Configure serial interface
3                Configure serial/TCP communication
4                Go to I/O menu
5                Go to administration menu
6                Configure security
7                Go to overview/statistics menu
8                AT commands
Help             Display menu specific help
Quit             Leave command mode
```

4.3.2 1<cr> → Display LAN configuration menu

```
LAN configuration
==================
up               go to main menu
set_dhcp         <enable/disable> DHCP
set_ip_add       Set IP address
set_ip_mask      Set IP subnet mask
set_ip_gway      Set default gateway
set_eth_speed    Set LAN speed (10/100/AUTO)
show_config      Show network configuration
show_config_o    Show original network configuration
save             Save configuration to flash
validate         Validate temporary conf. in Flash
ping             Ping test IP address
arp –a           Request ARP table
arp –d           Delete ARP table
help             Display menu specific help
quit             Leave command mode
```

4.3.3 2<cr> → Display Serial configuration menu

```
Serial config.
==================
up               go to main menu
set_baud         Set serial baud rate
set_stop         Set stop bits (1/1.5/2)
set_bits         Set data bits (7/8)
set_par          Set parity (EVEN/ODD/NONE)
set_flow         Set flow control (XON/RTS/NONE)
set_high_water   Set flow stall (%) [1..99]
set_low_water    Set flow restart (%) [1..99]
set_buf_size     Set serial input buffer size
set_buf_delay    Set serial input buffer delay (ms)
show_config      Show serial configuration
save             Save configuration to flash
help             Display menu specific help
quit             Leave command mode
```

4.3.4 3<cr> → Display Serial/TCP configuration menu

```
Serial/TCP
==================
up                go to main menu
set_raw_socket    <enable/disable> TCP socket is raw, not Telnet
set_iac_rx        <enable/disable> IAC rx filtering
set_iac_tx        <enable/disable> IAC tx stuffing
set_socket_tout   Set Telnet session inactivity timeout (min)
set_dialin        <enable/disable> dial-in (incoming calls)
set_dialin_port   Server port number for dial-in
set_esc           <enable/disable> escape sequence scanning
set_str           Set scanned escape sequence from serial
set_dialout       <enable/disable> dial-out on dial-out IP/port
set_dialout_port  Server port number for dial-out
set_dialout_ip    Server IP address for dial-out (outgoing calls)
set_auto          <enable/disable> Automatic dial-out
set_auto_hw       <enable/disable> Dial-out on DTR
show_config       Show serial configuration
save              Save configuration to flash
help              Display menu specific help
quit              Leave command mode
```

4.3.5 4<cr> → Display Input/Output configuration menu

```
Input/Output menu
==================
up                go to main menu
set_user          Set output mode [0..3] [<d>¦<u>]
get_user          Get output mode [0..3]
set_ddr           Set port type [4..5] [<i>¦<o>]
get_ddr           Get data direction
read_port         Read port input [0..5]
write_port        Set port output [0..5] [0/1]
read_adc          Read ADC input [6..8]
save              Save port setting as default
help              Display menu specific help
quit              Leave command mode
```

4.3.6 5<cr> → Display Administration menu

```
Admin. menu
==================
up                go to main menu
set_pass          Set user name and password
get_id            Set an identification name
show_config       Show configuration
save              Save configuration to Flash
reject            Reset non-saved changes
restore           Restore factory settings
reset             Reset device
download          Prepare download (WARNING – Flash deleted!)
help              Display menu specific help
quit              Leave command mode
```

4.3.7 6<cr> → Display Security menu

```
Security menu
==================
up                go to main menu
set_login         <enable/disable> Terminal menu login
set_ftp           <enable/disable> FTP server
set_telnet        <enable/disable> Telnet service
set_web           <enable/disable> WEB server
set_web_auth      <enable/disable> WEB server authentication
set_telnet_port   Set telnet listener port number
set_trusted_ip    Trusted IP address for WEB/TELNET
show_config       Show security configuration
save              Save configuration to flash
help              Display menu specific help
quit              Leave command mode
```

4.3.8 8<cr> → Display AT commands menu

```
AT commands
==================
up                go to main menu
AT                Test connection / an OK will be returned
ATD               Dial [r[trb]/t][IP]  [optional Port]
ATO               Resume data session
ATH               Terminate connection
go AT             Go to AT command mode
help              Display menu specific help
quit              Leave command mode
```

4.4 Description of commands

4.4.1 LAN configuration commands

set_dhcp:

set_dhcp enable	= enables DHCP Protocol
set_dhcp disable	= disables DHCP Protocol

Note: Before enable the DHCP protocol set IP Address to: 0.0.0.0

set_ip_add:

set_ip_add xxx.xxx.xxx.xxx = sets the IP address

Example: set_ip_add 192.168.0.1 <cr>

set_ip_mask:

set_ip_mask xxx.xxx.xxx.xxx = sets the IP subnet mask

Example: set_ip_mask 255.255.255.0 <cr>

set_ip_gway:

set_ip_gway xxx.xxx.xxx.xxx = sets the Gateway address

Example: set_ip_gway 192.168.0.20 <cr>

set_eth_speed:

set_eth_speed 10	= sets the Ethernet speed to 10Mbit/s
set_eth_speed 100	= sets the Ethernet speed to 100Mbit/s
set_eth_speed AUTO	= sets the Ethernet speed to auto detection

Example: set_eth_speed AUTO <cr>

show_config:

show_config	= show the actual configuration
show_config_o	= show the default network configuration

save:

save = save actual configuration

validate:

validate = validates actual configuration

Note:

The LAN configuration menu contains a validation procedure, which prevents the storing of incorrect configuration data. Saving of new settings cause an immediate reset and must be validated within a period of 3 minutes. After this timeout with no validation, the module returns to the previous configuration. This ensures that invalid settings do not render a device unreachable.

ping:

ping xxx.xxx.xxx.xxx = pings the IP Address entered

Example: ping 192.168.0.1<cr>

arp:

arp –a = show ARP table

arp –d = delete ARP table

4.4.2 Serial interface configuration commands

set_baud:

set_baud 9600 = sets the serial baud rate from 9600 to 230400
…
set_baud 230400 = sets the serial baud rate to 230400

Example: set_baud 9600 <cr>

set_stop:

set_stop 1 = sets 1 stop bits
set_stop 1.5 = sets 1.5 stop bits
set_stop 2 = sets 2 stop bits

Example: set_stop 1 <cr>

set_bits:

set_bits 7 = sets number of data bits to 7
set_bits 8 = sets number of data bits to 8

Example: set_bits 8 <cr>

set_par:

set_par EVEN	= sets parity to EVEN
set_par ODD	= sets parity to ODD
set_par NONE	= sets No parity

Example: set_par NONE<cr>

set_flow:

set_flow XON	= sets flow control to XON/XOFF
set_flow RTS	= sets flow control to RTS/CTS
set_flow NONE	= disables flow control

Example: set_flow RTS<cr>

set_high_water:

set_high_water xx	= set flow control stall from 1..99 in percent.

Example:

set_high_water 80 <cr>	/ If input buffer is 80% full, data reception is stopped.

set_low_water:

set_low_water xx	= set flow control restart from 1..99 in percent.

Example:

set_low_water 20<cr>	/ If buffer is reduced down to 20%, data reception is restarted.

set_buf_size:

set_buf_size [xxx]	= sets input buffer packet size in bytes from: 0…4K. This command is primarily to buffer the data sent from serial to ethernet.

Example:

set_buff_size 350<cr>	/ After reception of 350 bytes, data is packed in an IP frame and send to the remote side.

set_buf_delay:

set_buf_delay [t]	= Define input buffer packet timeout in ms from 0..10s. This command is analogous to the previous command. The buffering of data shall either wait for the buf_size configured (in the previous command) or the time t (ms)

Example:

set_buf_delay 100<cr>	/ After 100mS data is packed in an IP frame and send to the remote side independent of either the buffer is full or not.

4.4.3 Serial/TCP configuration commands

set_raw_socket:

set_raw_socket enable = Data transmission mode is raw
set_raw_socket disable = Data transmission mode is Telnet

Note:
set_dial_in and set_dialin_port configurations should be issued prior to this command

Example:

set_dial_in enable<cr>
set_dialin_port 8000<cr>
set_raw_socket enable<cr>

set_iac_rx:

set_iac_rx enable = IAC Rx filtering is enabled (Telnet specific command)
set_iac_rx disable = IAC Rx filtering is disabled.

set_iac_tx:

set_iac_tx enable = IAC Tx stuffing is enabled (Telnet specific command)
set_iac_tx disable = IAC Tx stuffing is disabled.

set_socket_tout:

set_socket_tout x = If the Telnet session is inactive for “x” seconds, the connection is terminated.

set_dialout:

set_dialout enable = Enable dial out (outgoing calls) on dial-out port.
set_dialout disable = Disable dial out.

Note: set_dialout_port should be issued prior to this command

Example:

set_dialout_port 8000<cr> / Defines port 8000 for dial-out (outgoing calls)
set_dialout enable<cr> .

ATD 192.168.1.33<cr> / Dial to a remote IP address

set_dialout_port:

set_dialout_port xxxx = Defines the server port number for dial -out

Example:
set_dialout_port 8000<cr> / Defines port 8000 for dial-out (outgoing calls)

set_esc:

set_esc enable	= Enable escape to command mode
set_esc disable	= Disable escape to command mode

This monitor flag will enable or disable the scanning of the escape sequence.

set_str:

set_str xxx	= Defines the escape string

The Telnet Server scans for this escape sequence and transfers the control to the command parser. By default, the Telnet Server scans for “+++”.

Example:

set_str +++<cr>	/ Defines “+++” as escape string (default).

set_dialin:

set_dialin enable	= Dial-in to the LAN modem enabled (incoming calls).
set_dialin disable	= Dial-in disabled.

Note:

set_dialin_port must be defined prior to this command

Example:

set_dialin_port 8000<cr>	/ Defines port 8000 for incoming calls.
set_dialin enable<cr>	/ Dial-in to the LAN modem enabled. The modem becomes reachable over port 8000.

set_dialin_port:

set_dialin_port xxxx	= Defines server port number for dial-in (incoming calls)

Example:

set_dialin_port 8000<cr>	/ Defines port 8000 for incoming calls.

set_dialout_ip:

set_dialout_ip xxxx	= Defines the default IP address for automatic dial-out

Example:

set_dialout_ip 192.168.1.32<cr>	/ Defines address for automatic dial-out function.

set_auto:

set_auto enable	= Enables the automatic dial-out function
set_auto disable	= Disables the automatic dial-out function

Note:

The triggering of the automatic dial-out procedure is accomplished with either the DTR line or with data sent to the modem. This should be defined with the set_auto_hw command.

The IP address, which is used together with the automatic dial-out procedure, should be defined with the set_dialout_ip command.

Example:

set_dialout_ip 192.168.1.47<cr>	/ Defines address for automatic dial-out function.
set_auto_hw enable<cr>	/ Automatic dial-out triggering with DTR line.
set_auto enable<cr>	/ Enables the automatic dial-out function

Action: upon activation of the DTR line, the LAN modem automatically initiates a connection to the IP address 192.168.1.47. After the connection is established, the DCD line became active and data can be exchanged.

set_auto_hw:

set_auto_hw enable	= Automatic dial-out triggering with DTR line.
set_auto_hw disable	= Automatic dial-out triggering with data send to modem.

4.4.4 Input / Output configuration commands

set_user:

set_user [0..3] [d/u]	=	Set mode of I/O ports. Ports : 0..3 Modes : d=default / u=user

Example:

set_user 0 d<cr>	/ Port 0 is set for default mode.

get_user:

get_user [0..3]	= Read port

Example: get_user 0<cr>

set_ddr:

set_ddr [4,5] [i/o]	=	Set port type of Ports 4,5 Ports: 4,5 Type: i = input / o = output

Example:

set_ddr 4 o<cr> / Port 4 is defined as output

get_ddr:

get_ddr [4,5] = Read type of port 4,5

Example:

get_ddr 4<cr> / Answer: Port direction:INPUT

read_port:

read_port [0..5] = Read input status of ports 0..5.

Example:

read_port 0<cr> / Answer: Port state: 1

write_port :

write_port [0..5][0,1] = Write status of ports 0..5 with 0/1.

Example:

write_port 5 1<cr> = Status of port 5 = 1
set_ddr 5 o<cr> = type of port 5 = output

read_adc:

read_adc [6..8] = Read ADC input of ports 6..8.

4.4.5 Administration commands

set_pass:

set_pass = Defines user name and password.

Example:

set_pass<cr>

/ Answer of module:

Please enter new user name (4..8 characters) : ADMIN <cr>
Please enter new password (4..8 characters) : PASSWORD<cr>
Please confirm the new password: PASSWORD<cr>

Answer of module: “New user data set”

set_id:

set_id xxxxxxxx = Defines an identification name of the module.

Example:

set_id MODEM<cr> / Defines “MODEM” as the identification name

reject:

reject = reset non-saved changes

restore:

restore = restore factory settings

reset:

reset = reset device

4.4.6 Security configuration commands

set_login:

set_login enable = enable Terminal menu login
set_login disable = disable Terminal menu login

Example: set_login disable<cr>

Note: This command selects if a login is required to enter the terminal menu from the serial port.

set_ftp:

set_ftp enable	= enable FTP Server
set_ftp disable	= disable FTP Server

Note: This command selects if the FTP server of the module is accessible from the remote side. The FTP server enables modification of the web pages. Disable it to protect against unwanted modifications.

set_telnet:

set_telnet enable	= Enable TELNET service
set_telnet disable	= Disable TELNET service

Note: This command enables the Telnet server of the module. Disable it to block login via Telnet from remote side. The command “set_telnet_port” defines the logical port of the server (default 23). This is a global flag, which will enable/disable the Telnet Services in the LAN-modem.

set_web:

set_web enable	= Enable WEB Server
set_web disable	= Disable WEB Server

Note: This command enables the WEB (HTTP) Server of the module. If disabled, configuration and monitoring of the module through the web browser is inhibited.

set_web_auth:

set_web_auth enable	= Enable WEB server authentication
set_web_auth disable	= Disable WEB server authentication

Note: This command enables the authentication and login on to the web server of the module. If disabled, the web server interface is unprotected and accessible without password entry.

set_telnet_port:

set_telnet_port xx	= Defines the Telnet listener port number

Telnet-port corresponds to the port number. By default the port number is TCP 23. The user is given an option to change this port number.

Example :

set_telnet_port 23	/ Defines 23 as Telnet port number

set_trusted_ip:

set_trusted_ip xxx.xxx.xxx.xxx = Defines the trusted IP Address

Example:

set_trusted_ip 192.168.0.39

None: If "Trusted IP address" is set non-zero, only the specified IP address (trusted address) is allowed to login on to the module and take configuration and monitoring.

4.4.7 AT commands description

AT:

AT = Basic AT command → "OK" will be returned

ATD:

ATD [mode] [IP] [Port] = Manual telnet dial-out command (outgoing calls)

Mode : T = Telnet mode / R = RAW mode
IP : IP address
Port : port number (optional)

Example :

ATD T 192.168.0.39 23<cr> / dial-out in Telnet Mode, Port = 23
ATD R 192.168.0.39 8000<cr> / dial-out in RAW Mode, Port = 8000

ATO:

ATO = On telnet dial-out, the control is transferred to the command parser passing the escape sequence "+++". Invoking "ATO" would resume the telnet dial-out exiting the command parser.

ATH:

ATH = Exits the command parser, unlocks the configurations and terminates the session.

go AT:

go AT = Go to AT command mode (valid only on serial port)

5. FIRMWARE UPDATE

The linear flash memory up-loader allows flash memory to be upgraded with revised modem firmware. This process transfers (uploads) the upgraded modem firmware (data) from the host computer to the LAN-modem using the serial RS232 interface. During the upload, the modem transfers the data to the flash memory device.

When the “download” command is issued, the present program in FLASH modem is deleted and the firmware boot loader is invoked. The user can then load the new firmware in S-record format.

1. Put the new modem firmware file (i.e. AL6000S_ V1.1.4.a79) in an appropriate directory on the computer’s hard disk.

2. Connect to the modem via the serial interface and command “download” in the “admin” menu. This will invalidate the program in FLASH and cause the modem to reboot. The serial settings will then be 115200, 8N1 and XON/XOFF flow control so it may be necessary to reconfigure the communications program used (eg. Hyperterminal or TeraTerm).

3. The following menu will appear when the ENTER key is pressed:

   ```
   Boot mode (V1.0)
   ================
   Enter “p” to program new code
   Enter “q” to quit and re-check
   Enter “s” to start program – no checking
   ```

4. Now start the flash up-loader by typing “p”. The following message appears upon issuing the “p” command.

   ```
   Are you sure ? (y/n)
   ```

5. Acknowledge with “y” and the following message will appear:

   ```
   FLASH deleted, please start S-rec download:
   ```

6. Start the upload to the modem, ensuring that the transfer takes place in binary mode. The upload takes about 15s to complete during which each S-record line programmed is displayed with a dot on the screen.

   After the firmware file has been loaded successfully, the following message appears and the new software starts automatically.

   ```
   Download successful. Board restarting
   ```

7. Check the new firmware version with show_config (Admin Menu).

8. The original configuration of the modem will normally be retained across a firmware upgrade

   However, in case of a special software version where also parameters may be reset, it would then be necessary to reconfigure the modem. Check with the release notes of the new firmware to be sure.

6. APPLICATIONS

6.1 Setting up a Telnet Configuration Session

Ensure that the TELNET service is enabled, its port number is known and the IP address of the modem is known (default 192.168.1.3 port 23). Configure password protection and trusted IP address as required. (These changes can always be performed over the local serial interface).

With a Telnet client connect to the LAN module's IP address and port number.

Afterwards you will see the AL6000S welcome message and you can start your configuration session over Telnet.

6.2 Start a manual dial-out session in TELNET mode

The following commands should be issued (example):

set_raw_socket disable<cr>	/ Ensure TCP socket is Telnet
set_dialout_port 8000<cr>	/ Defines port number 8000
set_dialout_ip 192.168.1.77<cr>	/ Defines server IP address 192.168.1.77
set_dial_out enable<cr>	/ Make sure that dial-out is activated

Then start the dial-out procedure with ATD command:

ATD<cr>	/ Connect to the default Telnet server

The default settings can be overwritten as required by extending the ATD command (example):

ATD T 192.168.1.37 1499	/ Connect to TELNET TCP socket at 192.168.0.37, on port 1499

If the TELNET server supports TELNET binary mode it is possible to perform file transfers, such as with xmodem and zmodem protocols.

6.3 Start a manual dial-out session in RAW mode

The following commands should be issued (example):

set_raw_socket enable<cr>	/ Ensure RAW socket is used
set_dialout_port 8000<cr>	/ Defines port number 8000
set_dialout_ip 192.168.1.77<cr>	/ Defines server IP address 192.168.1.77
set_dial_out enable<cr>	/ Make sure that dial-out is activated

Then start the dial-out procedure with ATD command:

ATD<cr>	/ Connect to the default Telnet server in RAW mode

The default settings can be overwritten as required by extending the ATD command (example):

ATD R 192.168.1.37 1499	/ Connect to RAW TCP socket at 192.168.0.37, on port 1499

If the TCP socket defines IAC filtering in one particular direction, this can be configured using the set_iac_rx and set_iac_tx command as appropriate. It can also be specified in the ATD command as follows:

ATD R R	/ Connect to RAW TCP socket at default IP address and port, using IAC filtering on received data

6.4 Automatic Dial-out

This function allows automatically establishing a dial-out procedure (outgoing call) to a remote IP address just by triggering with either the DTR line (CT108.2) or by data send to the modem. The following commands configure this function:

set_auto:

set_auto enable	= Enables the automatic dial-out function
set_auto disable	= Disables the automatic dial-out function

set_dialout_ip:

set_dialout_ip xxxx	= Defines the default IP address for automatic dial-out

Example:

set_dialout_ip 192.168.1.32<cr>	/ Defines IP address for automatic dial-out function.

set_auto_hw:

set_auto_hw enable	= Automatic dial-out triggering with DTR line.
set_auto_hw disable	= Automatic dial-out triggering with data send to modem.

Note:

The triggering of the automatic dial-out procedure is accomplished with either the DTR line or with data sent to the modem. This should be defined with the set_auto_hw command.

The IP address that is used together with the automatic dial-out procedure should be defined with the set_dialout_ip command.

Example:

```
set_raw_socket disable<cr>          / Ensure TCP socket is Telnet
set_dialout_ip 192.168.1.47<cr>     / Defines address for automatic dial-out function.
set_dialout_port 8000<cr>           / Defines port number 8000
set_auto_hw enable<cr>              / Automatic dial-out triggering with DTR line.
set_auto enable<cr>                 / Enables the automatic dial-out function
```

Action:

Upon activation of the DTR line, the LAN modem automatically initiates a TELNET connection to the IP address 192.168.1.47, port 8000. After the connection is established, the DCD line became active and data can be exchanged. The serial interface must be defined to use RTS/CTS flow control for this mode to operate correctly.

6.5 Dial-in

In order for dial-in to be supported, the Dial-in mode must be enabled. This can be performed using:

```
Set_dialin_port 1499                / Configure the dial-in port to 1499
set_raw_socket disable<cr>          / Ensure TCP socket is Telnet
set_dialin enable                   / enable dial-in
```

Remote clients can now establish TCP connections to the modem at its IP address, port 1499.

When a connection exists, data received from the serial port is transferred to the remote client/server and data received from the remote client/server is sent to the serial port.

Note also that the default settings can be configured comfortably using the web interface.