Ethernet Modem mode operation: ACCES I/O eNET port as a modem

Procedure:

1. Place the serial COM port into Ethernet Modem mode (via Telnet IP:23, Web page IP:80, or in the *eNET-Manager*). Note: the factory default IP for the ACCES I/O eNET is 192.168.0.35.
2. The serial port behaves like a "universal" HAYES-type modem to the device connected at the serial port. The device receives the expected modem replies to the "AT commands" sent, when communicating with the serial (modem) port.

General "AT" Commands:

The "AT" commands direct a modem to dial, answer, hang up, and perform other communication tasks. The **commands** are preceded by **AT**, and followed by <**cr**> (ie. ATcmdCR). The only exception is for the +++ sequence, which is used to **place modem into command mode**.

The modem **must be in command mode to accept AT commands**. Any command sent to the modem while it is in the transmission (CONNECTed) mode **is passed as data**.

The following command set is supported by the serial (modem) port of the ACCES I/O eNET:

Command	Description	Parameters
AT	The sequence AT followed by <CR>, returns OK, indicating that the serial port is in modem mode.	
AT**A**	**Answer**. After this command has been entered, the modem is placed into the **answer mode**: if an incoming RING is received, the modem will CONNECT with the incoming client. The ATA command is used to "answer" an incoming RING, which results in a CONNECT. If ATA is entered, and there is no incoming RING within 5 seconds, a timeout will occur, a NO CARRIER message will be displayed, and the modem will remain in command mode. NOTE: To place the modem into "**auto-answer**" mode, set the S0 register for a non-zero value (ie. ATS0=1 and AT&W to save).	
AT**Dstring**	**Dial**. Modem makes a connection to the IP address and port indicated by the string.	string = aaa.bbb.ccc.ddd:pppp
AT**DS=n** **DSn**	**Dial Stored**. Modem makes a connection to the stored IP and port address. To store an IP:Port, use AT&Z0="IP:Port" Note re **ATD**… commands: if the destination IP:Port does not accept the connection within 25-30 seconds, a NO CARRIER message will be displayed, and the modem will remain in command mode.	n = 0 remote location
AT**En**	**Echo**. Host commands are echoed.	n = 0 disable echo n = 1 enable echo (default)
AT**H** or AT**H0**	**(GO) on HOOK**. Close the connection. Enter the COMMAND mode using "+++", then enter ATH to close the connection.	n = 0 close the connection
AT**In**	**Inquiry**. Displays information about the modem.	n = 0 device name n = 1 details of unit n = 2 more detailed + IP n = 3 all info plus profile
AT**O**	**Go Online**. Returns from command mode to an active connection (if one was previously established).	
AT**Qn**	**Display Result Codes**. A "result" can be output after each command. Also see ATVn for format of result.	n = 0 display result n = 1 do not display result

Command	Description	Parameters
AT**Sr=n**	**Set Register**. Set value of register r to n. Note: only "S0" can be set for 0 or non zero. All others are fixed.	r = register number [r < 14] n = value to assign
	<u>"Sr" Register</u> <u>"n" Value (default)</u> <u>Purpose</u> S0 0 auto-answer disabled = 0 auto-answer enabled = non-zero S1 0 not used S2 43 escape to command mode char "+" S3 13 <CR> character. Fixed. S4 10 <LF> character. Fixed. S5 8 backspace character defined S6 3 not used S7 60 not used S8 2 not used S9 6 not used S10 7 not used S11 70 not used S12 50 guard time in 20 ms increments S13 0 not used	
AT**Sr?**	**Display Register**. Value of register r. Individual "S" register values can be obtained.	r = register number
AT**Vn**	**Format of Result Codes.** Note: text output is: <CR><LF>text<CR><LF> Note: numeric output is: number<CR>	n = 0 numeric form n = 1 text form
	<u>Text Output</u> <u>Numeric</u> <u>Meaning</u> OK 0 command executed CONNECT 1 connection established RING 2 connection is being requested NO CARRIER 3 connection broken or not made ERROR 4 illegal command	
AT**Z**	**Reset**. Close any open connections, and reset the S registers to the saved values.	
AT**&Cn**	**DCD Control**. [as Output].	n = 0 always active n = 1 follows connect status
AT**&Dn**	**DTR Control**. [as Input].	n = 0 ignore n = 1 on-to-off: go to command mode & maintain the connection. n = 2 on-to-off: go to command mode & close the connection. n = 3 on-to-off: go to command mode, close connection & do Reset.

Command	Description	Parameters

AT**&F**	**Load Factory Settings**.	Default parameters for commands and parameters are set:
		
		Serial Port: **9600**
		               8-data
		               no parity
		               1-stop bit
		               no flow control
		
		Address of remote host: **0.0.0.0:0**
		
		Auto-Answer is disabled: **S0 register = 0**
		
		Command line echo is enabled. **ATE1**
		
		Result codes are displayed as text. **ATQ1, ATV1**
		
		DCD line follows connection status [active if connected]. **AT&C1**
		
		DTR control: if on-to-off, then go to command mode and close connection. **AT&D2**
		
		DSR line is always active. **AT&S1**

AT**&Sn**	**DSR Control**.	n = 0 set DSR always active n = 1 follows connection status.
AT**&V**	**View Profile Settings**. Displays the S-register values, stored IP:Port of remote host, serial port and control line settings.	
AT**&W**	**Save Configuration Settings**. Saves the current settings into memory for re-use in subsequent operations.	
AT**&Z?**	**Display Address Settings**. Displays the stored IP:Port for the remote host.	
AT**&Z0=s**	**Store Address Settings**. Stores the IP:Port number for the remote host.	
+++	**Escape from the active connection to the modem command line mode**. Three consecutive "+" characters will place the modem into command mode. The first two "+" characters will be transmitted to the remote host on the link, third "+" character will place the modem into command mode – the third character is not transmitted to the remote host. The connection to the remote host is placed "on-hold" when the third "+" character is keyed in. No further data will be transmitted unless the transmission mode is re-enabled.	The follow-on options are: – use the ATO command to re-enable transmission to remote host – use the ATH command to terminate the connection – use the ATZ command to terminate the connection, and reset parameters to stored settings.

Extended AT commands:

EXTENDED "AT" commands are used for re-configuring the network parameters of the ACCES I/O eNET: password, IP address, port TCP socket number, net mask address, gateway address, DHCP enabled/disabled. Extended AT cammmands can also save parameters, get password/IP/TCP port/net mask/gateway, and reboot the ACCES I/O eNET.

To use any of the extended AT commands, the user must log in using the password that has been assigned to the ACCES I/O eNET (using one of Telnet, web browser, or *eNET-Manager* utility).

"AT%NLOGIN=password" must be entered before starting a session using the extended AT commands.:

Command	Description	Parameters
AT %**NLOGIN=password**	**Login.** "Password" is the password that has been assigned to the ACCES I/O eNET. If no password is in use, do not enter any characters after the "=". Press <CR>, then proceed to use the extended AT commands. NOTE: AT command session log-in passwords, whether entered in upper-case or lower-case, are converted to all upper-case before being compared for validity.	
AT %**NPPASSWORD=password**	**Network Put Password.** Assigns a new password to the ACCES I/O eNET. The new password is entered into a temporary memory register. Other commands may follow this command, but a SAVE command is required to submit this number for use. The SAVE command must be followed by a REBOOT command to implement the new password. NOTE: To undo any changes before issuing a REBOOT command, invoke the ATZ command. NOTE: AT command session log-in passwords, whether entered in upper-case or lower-case, are converted to all upper-case before being compared for validity.	
AT %**NPTCPPORTx=nn...n**	**Network Put TCP Socket Number for serial port *x*.** Assigns a new TCP socket number (nn...n) to serial port x, where *x* is a port on the ACCES I/O eNET. By default Port 1 is assigned 4098, Port 2 is assigned 4097, and so on. The number "nn...n" is entered into a temporary memory register. Other commands may follow this command, but a SAVE command is required to submit this number for use. The SAVE command must be followed by a REBOOT command to implement the new socket number for the port. NOTE: To undo any changes before issuing a REBOOT command, invoke the ATZ command.	
AT %**NPIP=xxx.xxx.xxx.xxx**	**Network Put IP.** Enters a new IP address for the ACCES I/O eNET. This number is entered into a temporary memory register. Other commands may follow after this command, but a SAVE command is required to submit this IP address for use. The SAVE must be followed by a REBOOT command to implement the new IP address for the ACCES I/O eNET. NOTE: To undo any changes before issuing a REBOOT command, invoke the ATZ command.	

Command	Description	Parameters
AT %NPMASK=xxx.xxx.xxx.xxx	**Network Put Netmask.** Enters a new netmask address for the ACCES I/O eNET. This number is entered into a temporary memory register. Other commands may follow after this command, but a SAVE command is required to submit this netmask address for use. The SAVE must be followed by a REBOOT command to implement the new netmask address for the ACCES I/O eNET. NOTE: To undo any changes before issuing a REBOOT command, invoke the ATZ command.	
AT %NPGATE=xxx.xxx.xxx.xxx	**Network Put Gateway.** Enters a new gateway address for the ACCES I/O eNET. This number is entered into a temporary memory register. Other commands may follow after this command, but a SAVE command is required to submit this gateway address for use. The SAVE must be followed by a REBOOT command to implement the new gateway address for the ACCES I/O eNET. NOTE: To undo any changes before issuing a REBOOT command, invoke the ATZ command.	
AT %NPDHCP=ENABLED	**Network Put DHCP Enabled.** Sets the ACCES I/O eNET for acquiring its IP address from a network DHCP Server. If DHCP is enabled the ACCES I/O eNET will not operate until a valid IP address is obtained. To implement this command, invoke SAVE, then invoke REBOOT. NOTE: Use *eNET Manager* to locate the ACCES I/O eNET on the network to make any changes if the ACCES I/O eNET has not yet received a valid IP address.	
AT %NPDHCP=DISABLED	**Network Put DHCP Disabled.** Disables the DHCP mode of operation. A set of valid/useable IP/netmask/gateway addresses will need to be entered for ACCES I/O eNET operation on the network. To implement this command, invoke SAVE, then invoke REBOOT.	
AT %NSAVE	**Network Save.** Stores the parameters that have been entered into the ACCES I/O eNET in anticipation of making the changes permanent. If the SAVE command is not invoked before rebooting, the previous parameters will remain valid after the reboot.	
AT %NREBOOT	**Network Reboot.** Reboots the ACCES I/O eNET. If a SAVE command has been issued before rebooting, then the parameters that were stored by the SAVE command will be used in the reboot of the ACCES I/O eNET.	
AT %NGPASSWORD	**Network Get Password.** Returns the password that is stored in the register. The password can be the current valid password, or the last password that was entered (using the AT%NPPASSWORD cmd) prior to a SAVE and REBOOT sequence.	
AT %NGIP	**Network Get IP.** Gets the IP address that is stored in the temporary memory register of the ACCES I/O eNET. This may also be the current address being used, if a change command has not been invoked. If the ATZ command is issued prior to the Network Get IP command, then the returned address is the current address in use for the ACCES I/O eNET.	

Command	Description	Parameters
AT **%NGMASK**	**Network Get Netmask.** Gets the netmask address that is stored in the temporary memory register of the ACCES I/O eNET. This is the current address being used, if a change command has not been invoked. If the ATZ command is issued prior to the Network Get Netmask command, then the returned address is the current netmask in use for the ACCES I/O eNET.	
AT **%NGGATE**	**Network Get Gateway.** Gets the gateway address that is stored in the temporary memory register of the ACCES I/O eNET. This can also be the current address being used, if a change command has not been invoked. If the ATZ command is issued prior to the Network Get Gateway command, then the returned address is the current address in use for the ACCES I/O eNET.	
AT **%NGTCPPORT=x**	**Network Get TCP Socket Number for serial port *x*.** Returns the current value of the TCP port socket number for serial port *x*.	