SERIAL-TO-WIFI ADAPTER

COMMAND REFERENCE

Reference: GS-S2WF-CFG

Version: SP-4.13

Date: *21-Mar-11*

Version	Date	Remarks
1.0	17 Nov 2009	Initial release. Applies to S2WiFi version 1.0.9 and above.
1.2	5 March 2010	Applies to S2WiFi version 1.0.9 and above.
2.0	8 June 2010	Updated and reformatted. Applies to S2WiFi version 1.0.9 and above.
2.2	28 Oct 2010	General Improvements
3.0	9-Nov-10	GA
3.1	16-Dec-10	SPI Interface Configuration and Parameters
4.2	16-Dec-10	Sync version with other docs
4.4	11-Jan-11	AT? Is no longer supported Added Bulk Data Mode, data transfers are managed using escape sequences (Esc Z)
4.5	14-Jan-11	Sync version with other docs
4.6	17-Jan-11	Removed <esc> T and <esc> Q commands
4.7	18-Jan-11	Added rate information to AT+UNSOLICITEDTX command
4.12	21-Mar-11	Added enhanced asynchronous notification Added strict security configuration Added Bulk Data Transfer Continuous escape sequence Rev versions to sync with other release docs
4.13	2-Jun-11	Added DHCP Server Added DNS Server Added DNS Lookup and Client Added Memory Trace

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Command	Parameters	Responses / Effects
COMMAND INTERFACE		
AT	(none)	"OK"
ATE	n=0 (disable) =1 (enable)	IF 1, echo all input.
ATV	n=0 (disable) =1 (enable)	IF 1 responses are ASCII, else numerical codes.
AT?	(none)	No Longer Supported
UART / ADAPTER INTERFACE CONFIGURATION		
ATB	<baudrate>[[,<bitsperchar>] [,<parity>][,<stopbits>]]	UART parameters are immediately reset to values provided.
AT&K	n=0 (disable) =1 (enable)	IF 1, software flow control is enabled.
AT&R	n=0 (disable) =1 (enable)	IF 1, hardware flow control is enabled.
ATS	n=0 to 5; p=(parameter value)	Sets various timeout values; 0=Network Connection Timeout 1=Auto Associate Timeout 2=TCP Connection Timeout 3=Association Retry Count 4= Nagle Algorithm Wait Time 5= Scan Time
ATI	n=value	Various Adapter ID information; 0=OEM ID 1=Hardware Version 2=Software Version
PROFILE MANAGEMENT		
AT&W	n=0 (profile 0) =1 (profile 1)	Save profile specified by n.
ATZ	n=0 (profile 0) =1 (profile 1)	Load profile specified by n.
AT&Y	n=0 (profile 0) =1 (profile 1)	Set default profile to the value n.
AT&F	(none)	Restore profile to factory default values.
AT&V	(none)	Current and saved profile parameter values as ASCII.
WI-FI INTERFACE		
AT+NMAC=	<MAC ADDRESS>	Sets the adapter MAC address (an 8-byte colon-delimited hexadecimal number), and

Command	Parameters	Responses / Effects
		stores the value in flash memory.
AT+NMAC2=	<MAC ADDRESS>	Sets the adapter MAC address (an 8-byte colon-delimited hexadecimal number), and stores the value in non-volatile RAM.
AT+NMAC=?	(none)	Returns the current adapter MAC address.
AT+NMAC2=?	(none)	Returns the current adapter MAC address.
AT++WREGDOMAIN=	<Regulatory Domain>	FCC → supported Channel range is 1 to 11. ETSI → supported Channel range is 1 to 13. TELEC → supported Channel range is 1 to 14.
AT+WREGDOMAIN=?	(none)	Configured regulatory domain in the Serial2WiFi adaptor
AT+WS=	[<SSID>[,<BSSID>][,<Channel>][,<Scan Time>]]	Network scan, returns list of found networks in the format: <SSID>,<BSSID>,<Channel>,<RSSI>,<Mode>,<Security> SSID may be a string of up to 32 ASCii characters in length
AT+WM=	n=0 (infrastructure) 1 (ad hoc) 2 (limited ap)	Set 802.11 Station operating mode. If n is 2, the mode is set to limited AP so that the adapter can act as a limited wireless Access Point.
AT+WA=	<SSID>[,[<BSSID>][,<Ch>]]	Associate to specified SSID, BSSID, and channel.
AT+WD	(none)	Disassociate from the current network.
ATH	(none)	Disassociate from the current network.
AT+WWPS=	<METHOD>[,PIN]	Associate to an AP using WPS METHOD is push button (1) or pin (2). PIN is the pin for PIN method.
AT+NSTAT=?	(none)	Current wireless and network configuration.
AT+WSTATUS		Adapter reports the current network configuration to the serial host
AT+WRSSI=?	(none)	Current RSSI as ASCII.
AT+WRATE=?	(none)	Current transmit rate as ASCII.
AT+WRETRY=	<retrycount>	Value of 802.11 TX retry is reset.

Command	Parameters	Responses / Effects
Wi-Fi SECURITY		
AT+WAUTH=	n=1 to 2	Authentication mode setting; see 4.7.1 of [1].
AT+WWEPn=	n=1 to 4, <key>	WEP key n is set to the value in <key>.
AT+WWPA=	<passphrase>	WPA passphrase set to the value in <passphrase>.
AT+WPAPSK=	<SSID>,<passphrase>	Computes and stores the WPA2 PSK value.
AT+WPSK=	<PSK>	Sets the WPA2 pre-shared key to the <PSK>.
AT+ WEAPCONF=	<Outer Authentication>,<Inner Authentication>,<user name>,<password>	Set the Outer authentication, Inner authentication, user name and password for EAP Security. This command returns the normal response codes. The valid outer authentication values are: Eap-FAST: 43 Eap-TLS: 13 Eap-TTLS: 21 Eap-PEAP: 25 The valid Inner Authentication values are: Eap-MSCHAP: 26 Eap-GTC: 6
AT+WEAP=	<Type>,<Format>,<Size>, < Location> <ESC>W <data of size above>	Configure certificate for EAP-TLS
AT+TCERTADD=	<Name>,<Format>,<Size>,<Location>	Configure the certificate for SSL/HTTPS and EAP/TLS
AT+TCERTDEL=	<certificate name>	Delete a certificate from memory
AT+WSEC= n	0 – Auto security (All) 1 – Open security 2 – Wep security 4 – Wpa-psk security 8 – Wpa2-psk security	The s2w adapter supports either one of the above value with default security configuration as auto. This strict security compliance is not applicable for WPS feature.

Command	Parameters	Responses / Effects
	16 – Wpa Enterpice 32 – Wpa2 Enterpice	
WIRELESS CONFIGURATION		
AT+WRXACTIVE=	n=0 (disable) =1 (enable)	If 1, 802.11 radio is enabled.
AT+WRXPS=	n=0 (disable) =1 (enable)	If 1, Power Save mode is enabled.
AT+MCSTSET=	n=0 (disable) =1 (enable)	If 1, multicast reception is enabled.
AT+WP=	<power>	Transmit power set to <power>.
AT+WSYNCINTRL=	<n> 1 to 65535.	Configure the sync loss interval
AT+EXTPA=	n=0 (disable) =1 (enable)	Enable/disable the external PA
AT+PSPOLLINTRL=	<n> 1 to 65535.	
NETWORK INTERFACE		
AT+NDHCP=	n=0 (disable) =1 (enable)	If 1, DHCP is enabled.
AT+DHCPSRVR=	n=0 (disable) =1 (enable)	Prior to start the server, the adapter should be configured with a valid static ip address.
AT+NSET=	<Src Address>,<Net-mask>,<Gateway>	Static network parameters; overrides previous values.
AT+DNS=1/0,<url>	n=0 (disable) =1 (enable), URL	URL is the DNS name associated to the DNS IP address
AT+DNSLOOKUP=	<URL>,[<retry>,[<timeout=S>]	Query DNS server for address of hostname URL.
AT+DNSSET=	<DNS1 IP>,[<DNS2 IP>]	Set the DNS server addresses to be used.
AT+STORENWCONN		Store network connection parameters prior to transition to Standby.
AT+RESTORENWCONN		Restore network connection parameters after wake from Standby.
CONNECTION MANAGEMENT		
AT+NCTCP=	<Dest-Address>,<Port>	Attempt TCP client connection to Destination; CONNECT <CID> if successful.
AT+NCUDP=	<Dest-Address>,<Port> [<,Src.Port>]	Open UDP client socket to Destination; CONNECT <CID> if successful. The port range 0xBAC0 to 0xBACF may not be used.
AT+NSTCP=	<Port>	Start a TCP server on Port; CONNECT <CID> if successful.
AT+NSUDP=	<Port>	UDP server on Port; CONNECT <CID> if successful. The port range 0xBAC0 to 0xBACF may not be used.
AT+CID=?		Returns the current CID configuration.

Command	Parameters	Responses / Effects
AT+NCLOSE=	<CID>	Close connection identified by CID.
AT+NCLOSEALL	(none)	Close all open connections.
AT+SETSOCKOPT=	<Cid>,<Type>,<Parameter>,<Value>,<Length>	Configure a socket which is identified by a Cid
AT+SSLOPEN=	<cid>,<certificate name>	Open an SSL connection
AT+SSLCLOSE=	<cid>	Close an SSL connection
AT+HTTPCONF=	<Param>,<Value>	Configure an HTTP client
AT+HTTPCONFDEL=	<param>	The adapter removes the HTTP configuration specified by the param.
AT+HTTPOPEN=	<host>,<Port Number>,[<SSL Flag>,<certificate name>]	Open an HTTP client connection. This command opens an HTTP client on the adaptor and connects to the server specified by the host name or IP address
AT+HTTPSEND=	<cid>,<Type>,<Timeout>,<Page>,[Size of content]	GET/POST HTTP data on the HTTP client connection
AT+HTTPCLOSE=	<cid>	Close the HTTP client connection
AT+NRAW=	<0|1|2>	Enable / Disable Raw Ethernet support.
AT+UNSOLICITEDTX=	<Frame Control>,<Sequence Cntrl>,<Channel>,<Rate>,<WmmInfo>,<Receiver Mac>,<Bssid of AP>,<Frame Length>	Unsolicited data transmission Rate: is the rate at which the data to be send and the possible values are: RATE_1MBPS = 130, RATE_2MBPS = 132, RATE_5_5MBPS = 139, RATE_11MBPS = 150
BATTERY CHECK		
AT+BCHKSTRT=	<Batt.chk.freq>	Start checking battery each 0 <Batt.chk.freq ≤ 100 packets transmitted.
AT+ BATTLVLSET=	<Warning Level>,<Warning Freq>,<Standby Level>	Set the battery warning/standby level to enable the adaptor's internal battery measuring logic
AT+BCHK=	<Batt.chk.freq>	Reset value of battery check frequency.
AT+BCHKSTOP		Stop checking battery.
AT+BATTVALGET		Retrieve the most recent battery check value.
POWER STATE MANAGEMENT		
AT+PSDPSLEEP	(none)	Enable SOC Deep Sleep power saving mode.

Command	Parameters	Responses / Effects
AT+PSSTBY=	<x>[,<DelayTime>,<Alarm 1 pol.>,<Alarm2 pol.>]	Request transition to Standby for x milliseconds.
AUTO CONNECTION		
AT+WAUTO=	<mode>,<SSID>,<BSSID> ,[channel]	Sets WiFi parameters to be used for Auto Connect.
AT+NAUTO=	<Type>,<Protocol>,<Destination IP>,<Destination Port>	Sets network parameters to be used for Auto Connect.
ATC	n=0 (disable) =1 (enable)	IF 1, Auto Connect is enabled on next reboot or AT.
ATA	(none)	Start Auto Connect, including association.
ATA2	(none)	Start Auto Connect using existing association.
ATO	(none)	Return to a previous Auto Connect session; returns an error if no such session exists.
PROVISIONING		
AT+WEBPROV=	<user name>,<passwd>	Provisioning through web pages
AT+WEBLOGOADD=	<size> maximum size is 1788 bytes	Adding the Logo that will appear on the web pages used for provisioning.
RF TEST		
AT+RFFRAMETXSTART=	<Channel>,<Power>,<Rate>,<No.Of.Times>,<Fr.Intrvel>,<FrameControl>,<DurationId>,<Sequence Control>,<frameLen>,<Preamble>,<Scrambler>[,<Dst Mac>,<Src Mac>]	Enable the asynchronous frame transmission
AT+RFRXSTART=	<Channel>[,<Sendtouser>]	Enable the asynchronous frame reception
AT+RFWAVETXSTART=	<Modulated>,<Channel>, <Rate>,<PreambleLong>, <ScamblerOff>,<Cont.Tx>, <Power>,<Ssid>	Enable the modulated/un-modulated wave transmission
AT+RFSTOP		Stop any of the RF tests transmission/reception
SPI		
AT+SPICONF=	<clockpolarity>, <clockphase>	If clock polarity is 0, then inactive state of serial clock is low. If clock polarity is 1, then inactive state of serial clock is high.
MISCELLANEOUS		

Command	Parameters	Responses / Effects
AT+FWUP=	<SrvIp>,<SrvPort>, <SrcPort>, <retry>	Get a firmware upgrade from the server address/port to the adapter port SrcPort.
AT+SETTIME=	<dd/mm/yyyy>, <HH:MM:SS>	Set the adaptor system time
AT+GETTIME=		Sends the current system time in milliseconds since epoch (1970) followed by the standard command response to the serial interface.
AT+DGPIO=	<GPIO-NO>, <SET/RESET(0/1)>	Set or reset (high/low) a GPIO pin
AT+ERRCOUNT=		The error counts include: Watchdog reset counts Software reset counts Wlan abort/assert counts
AT+VER=?		Return the current adapter firmware versions.
AT+PING=	<IP>,[[Trails],[<Interval>],[<Len>],[<TOS>],[<TTL>],[<PAYLOAD>]]	PING the IP address provided. Trails = 0 will ping until <Esc> C is issued.
AT+TRACEROUTE=	<IP>,[[Interval],[<MaxHops>],[<MinHops>],[<TOS>]]	Trace the route to the IP address provided.
AT+ASYNCMSGFMT	0 – Disable this feature 1 – Enable this feture	S2w Adapter supports an enhanced asynchronous notification method.
AT+MEMTRACE		Sends the memory trace information to the serial interface, including: Number Of Allocation Number Of Free Current Used Memory in bytes Peak Memory Usage in bytes Memory Details of currently used allocations in the following format: *<address>,<line number>,<size>,<module name>* Number of Allocations to be freed

Commands must be terminated with a carriage return and line feed, <CR><LF>.

Parameters in [ ] are optional. Values are expressed as ASCII text unless otherwise specified.

Default return messages are:

STATUS	MESSAGE (VERBOSE ENABLED)	MESSAGE (VERBOSE DISABLED)
VALID INPUT	OK	0
INVALID INPUT	ERROR: INVALID INPUT	2

Some commands can return other error messages; see [1] for more information.

Escape Sequence	Description
<Esc>S CID	This escape sequence selects the specified Connection ID as the current connection. This switches the connection to be used without exiting from the Data mode of operation. Use this sequence to send data from a UDP client (must be done before data can be received by that client). Example: <Esc>S10123456789<Esc>E where 1 is the UDP client CID and 012...9 is the data to be sent.
<Esc>U CID remote address: remote port:	This escape sequence is used when sending and receiving UDP data on a UDP server connection. The remote address and remote port is transmitted in ASCII text encoding and terminated with a ':' character. Example: <Esc>U4192.168.1.1:52:<data><Esc>E
<Esc>u CID <remote address> <remote port>	This escape sequence is used when sending and receiving UDP data on a UDP server connection. The remote address and remote port is transmitted in binary encoding with the MSB transmitted first. The following example shows the header to transmit a UDP packet using binary addressing taking up 9 bytes (d denoting decimal value): <Esc>u4<192d><168d><1d><1d><0d><52d><data><Esc>E
<Esc>E	End-of-Data sequence, indicating end of a transmit frame, and start of transmission. The data received is sent on the network, and the interface returns to Command mode.
<Esc>C	This sequence causes transmission of the data received, after which the currently selected connection is closed, and the interface returns to Command Mode. Any buffered data is sent before the connection is closed.
<Esc>O	"OK": This sequence is sent to the serial host by the Serial2WiFi Adapter upon successful completion of either the <Esc>S or <Esc>E commands.
<Esc>F	"FAILURE": This sequence is sent to the host by the Serial2WiFi Adapter if an <Esc>S or <Esc>E command failed.
<Esc>xxx	If an unknown character 'xxx' is detected after an <Esc> character the <Esc> and the <xxx> character are ignored.
<Esc>R:<Length>: <Dst.Addr><Src.Addr><EtherType> RawPayload>	This sequence is used to transmit or receive a raw Ethernet frame.

<Esc>Z<Cid><Data Length xxxx 4 ascii char><data>	Each escape sequence starts with the ASCII character 27 (0x1B), the equivalent to the ESC key. The contents of < > are a byte or byte stream. ► Cid is connection id (udp, tcp, etc) ► Data Length is 4 ascii char represents decimal value i.e. 1400 byte (0x31 0x34 0x30 0x30). ► Data size must match with specified length. Ignore all command or esc sequence in between data pay load.
<Esc>Y<CID> remote address: remote port:<Data Len 4 digit ascii><Data>	This escape sequence is used when sending UDP data on a UDP server connection. When this command is used, the remote address and remote port is transmitted in ASCII text encoding and terminated with a ':' character. Example: <Esc>Y4192.168.1.1:52:<Data Len><data>
<Esc>y<CID> <remote address> < remote port><Data Len 4 digit ascii><Data>	This escape sequence is used when receiving UDP data on a UDP server connection. When this sequence is used, the remote address and remote port is transmitted in ASCII text encoding and separated be a space( ) character. Example: <Esc>y4192.168.1.1 52<Data Len><Data>

The contents of < > are a byte or byte stream, except for <Esc>; literals outside brackets are ASCII characters.

Reference

1. Serial-to-WiFi Adapter Application Programming Guide, GS-S2WF-APG, GainSpan Corporation.