



Multipoint Serial Port Adapter™

Version 3

AT Commands

*connect***Blue**

**Multipoint Serial Port
Adapter™
Version 3**

AT Commands

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Chapter 1

Introduction

1.1 Related Documents

- The **Serial Port Adapter AT Commands** document, contains a description of the AT commands supported in the Serial Port Adapter. It also contains information on how to use the AT commands to create Bluetooth applications.
- The **Serial Port Adapter AT Commands Multi** document (this document) highlights changes for the multipoint firmware in comparison to the point-to-point firmware.
- The **OEM Serial Port Adapter Electrical & Mechanical Datasheet** contains important information about the OEM Serial Port Adapter. Read this document if you are using the OEM Serial Port Adapter.

Chapter 2

Multipoint vs. Point-to-point

The standard point-to-point firmware is described in the **Serial Port Adapter AT Commands** specification. This document describes only the changes for the multipoint firmware and should not be considered as a stand-alone document. The differences are highlighted in red.

Chapter 3

AT Commands Reference

3.1 Data Mode Commands

Read_Default_Server_Profile (AT*ADDSP?)

AT Command	Description
AT*ADDSP?<CR>	This command reads the default server profile. The default server profile is the profile that other devices can connect to when the Serial Port Adapter is in data mode. The default server profile is activated when the Serial Port Adapter is moved to data mode if no connection exists. The default server profile is deactivated when the Serial Port Adapter is moved from data mode to AT mode.

Responses	Description
<CR><LF>*ADDSP:<role_and_profile><CR><LF>OK<CR><LF>	Successful response.
<CR><LF>ERROR<CR><LF>	Error response.

Response Parameters	Type	Value
role_and_profile	Enumerator	0: Serial Port Profile (DevB role) (default value). The number of services is equal to max number of slaves. 1: Dial-Up Networking Profile (Gateway role). The number of services is equal to max number of slaves. 2: LAN Access Profile (LAN Access Point role) 3: Serial Port Profile (DevB role) and Dial-Up Networking (Gateway role). For the multipoint firmware, the number of slaves divided by two services of each profile is registered rounding up. E.g. if seven slaves are allowed, there will be four SPP and four DUN services registered. 255: No profile

Write_Default_Server_Profile (AT*ADDSP=)

AT Command	Description
AT*ADDSP=<role_and_profile>,<store_in_startup_database><CR>	This command writes the default server profile. The default server profile is the profile that other devices can connect to when the Serial Port Adapter is in data mode. The default server profile is activated when the Serial Port Adapter is moved to data mode if no connection exists. The default server profile is deactivated when the Serial Port Adapter is moved from data mode to packet mode.

Command Parameters	Type	Value
role_and_profile	enumerator	0: Serial Port Profile (DevB role) (default value). The number of services is equal to max number of slaves. 1: Dial-Up Networking Profile (Gateway role). The number of services is equal to max number of slaves. 2: LAN Access Profile (LAN Access Point role) 3: Serial Port Profile (DevB role) and Dial-Up Networking (Gateway role). For the multipoint firmware, the number of slaves divided by two services of each profile is registered rounding up. E.g. if seven slaves are allowed, there will be four SPP and four DUN services registered. 255: No profile
store_in_startup_database	enumerator	0: The setting will only be valid for the current power cycle. 1: The Serial Port Adapter will remember the setting between power cycles. The settings database in the Serial Port Adapter will be updated.

Responses	Description
<CR><LF>OK<CR><LF>	Successful response.
<CR><LF>ERROR<CR><LF>	Error response.

Model	Constraint
cB-OEMSPA310 cB-OEMSPA311 cB-OEMSPA331 cB-OEMSPA312 cB-OEMSPA332	The LAN access profile is not supported. If the current default server profile is "255: No profile", the "store in startup database" parameter must be 1 and the module must be restarted for the command to take affect.
cB-OEMSPA13 cB-OEMSPA33	"3: Serial Port Profile (DevB) and Dial-Up Networking (Gateway)" not supported.

Read_Max_No_Of_Remote_Peers (AT*ADMRP?)

AT Command	Description
AT*ADMRP?<CR>	For some Serial Port Adapters it is possible to have more than one remote peer defined. This command reads the maximum number of allowed remote peers.

Responses	Description
<CR><LF>*ADMRP:<max_no_of_remote_peers> <CR><LF>OK<CR><LF>	Successful response.
<CR><LF>ERROR<CR><LF>	Error response.

Response Parameters	Type	Value
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max_no_of_remote_peers	integer	The maximum number of allowed remote peers.
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Model	Constraint
cB-OEMSPA310 cB-OEMSPA311 cB-OEMSPA331 cB-OEMSPA312 cB-OEMSPA332	Not supported. The parameter always has the value of one. Multipoint firmware This command is supported.

Write_Default_Remote_Peer (AT*ADWDRP=)

AT Command	Description
AT*ADWDRP=<peer_id>,<bd_addr>,<connect_scheme>,<update_remote_peer_on_incoming>,<device_name>,<store_in_startup_database><CR>	This command writes the Bluetooth device address, connect scheme and device name of the currently selected default remote peer.

Command Parameters	Type	Value
peer_id	integer	The peer ID can be between 0 and the value written by the Write_No_Of_Peers command -1 or read by the Read_No_Of_Peers command -1.
bd_addr	Bd_Addr	Bluetooth device address of the default remote peer.
connect_scheme	integer	See Read_Default_Remote_Peer.
update_remote_peer_on_incoming	enumerator	See Read_Default_Remote_Peer.
device_name	string	See Read_Default_Remote_Peer.
store_in_startup_database	enumerator	0: The setting will only be valid for the current power cycle. 1: The Serial Port Adapter will remember the setting between power cycles. The settings database in the Serial Port Adapter will be updated.

Responses	Description
<CR><LF>OK<CR><LF>	Successful response.
<CR><LF>ERROR<CR><LF>	Error response.

Model	Constraint
cB-OEMSPA310 cB-OEMSPA311 cB-OEMSPA331 cB-OEMSPA312 cB-OEMSPA332	The parameter <device_name> is only used when bit 3 in the connect scheme is set. The maximum length is 32 characters. Multipoint firmware If the SPA is configured both as a client and a server, remote devices connecting to the SPA may affect the <i>active</i> number of remote peers. E.g. consider the case where 7 slaves are allowed. The configured remote peers start from index 0 and go to index 6. The services (SPP and/or DUN) start from index 6 and go to index 0. This means that a configured remote peer of index e.g. 4 is not activated if 3 (index 6, 5 and 4) remote devices have setup connections to the registered services.

cB-OEMSPA13 cB-OEMSPA33	Connect to name functionality is not supported. This means that bit 3 in the connect scheme parameter is ignored. Bits 4 to 31 are ignored.
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Read_Wireless_Multidrop_Configuration (AT*ADWM?)

AT Command	Description
AT*ADWM?<CR>	This request returns whether or not the Wireless Multidrop™ feature has been enabled. When the Wireless Multidrop™ has been enabled; all data sent to the Serial Port Adapter in data mode will be forwarded to all connected devices. Data received from a remote device will be forwarded to the host. If the Auto_Forward parameter is set to TRUE is will also forward all received data to all the other connected devices. Connections to remote devices can be established using three methods: - Let the Serial Port Adapter connect to the desired devices when it is in data mode. The host uses the request Write_No_Of_Remote_Peers and Write_Default_Remote_Peer to tell the Serial Port Adapter how many devices to connect to, which devices to connect to and when to connect to the defined devices. - A server has been enabled using the request Write_Default_Server_Profile and one or several devices connect to this server. - One or several connections are established in packet mode using the request Connect_To_Serial_Service_Data_Mode. After all desired connection have been setup by the host it moves to data mode. When the Wireless Multidrop™ has been disabled; only one connection at a time can be established. A maximum of one remote peer can be defined.

Responses	Description
<CR><LF>*ADWM:<enabled>, <auto_forward><CR><LF>OK<CR><LF>	Successful response
<CR><LF>ERROR<CR><LF>	Error message.

Response Parameters	Type	Value
enabled	enumerator	0: Wireless Multidrop™ disabled (default value). 1: Wireless Multidrop™ enabled for maximum number of slaves. 2-7: Wireless Multidrop™ enabled for the parameter "enabled" number of slaves.
auto_forward	enumerator	0: Data received from a connected device will only be forwarded to the host (default value). 1: Reserved for future use.

Model	Constraint
cB-OEMSPA310 cB-OEMSPA311 cB-OEMSPA331 cB-OEMSPA312	Not supported. Multipoint firmware Wireless Multidrop™ is supported.

cB-OEMSPA332

Write_Wireless_Multidrop_Configuration (AT*ADWM=)

AT Command	Description
AT*ADWM=<enable>, <auto_forward>, <store_in_startup_database><CR>	See Read_Wireless_Multidrop_Configuration.

Command Parameters	Type	Value
enabled	enumerator	See Read_Wireless_Multidrop_Configuration.
auto_forward	enumerator	See Read_Wireless_Multidrop_Configuration.
store_in_startup_database	enumerator	0: The setting will only be valid for the current power cycle. 1: The Serial Port Adapter will remember the setting between power cycles. The settings database in the Serial Port Adapter will be updated.

Responses	Description
<CR><LF>OK<CR><LF>	Successful response.
<CR><LF>ERROR<CR><LF>	Error response.

Model	Constraint
cB-OEMSPA310 cB-OEMSPA311 cB-OEMSPA331 cB-OEMSPA312 cB-OEMSPA332	Not supported. Multipoint firmware Wireless Multidrop™ is supported.

3.2 Informational Commands

Write_Link_Policy (AT*AMLP=)

AT Command	Description
AT*AMLP=<link_policy>, <parameter>, <store_in_startup_database><CR>	Write link policy. The link policy can be chosen to optimize the link for a specific application. The link policy can be chosen to reduce power consumption, get faster response times, increase the range or to optimize the SPA as either sender or receiver. Note! Using other link policies than the default may lead to interoperability problems. Verify that the chosen link policy works with other devices your application is intended to inter-operate with. If not, use the default link policy. Link policy 3,4,10,12 gives the shortest response times. Link policy 8 combined with stop mode (AMPM: 3) gives the lowest power consumption.

		When using a baud rate of 460 kbps or more on the serial interface, a combination of link policy 2 on the sender and link policy 1 on the receiver gives the highest throughput. When using a slower baud rate, then the default link policy gives equally high throughput. If the remote device rejects the link policy requested by the SPA, then the red LED gives an error indication. If the remote device rejects the link policy, then the default link policy is used.
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Command Parameters	Type	Value
link_policy	integer	Link policy configurations: 0: Default, No sniff, All packet sizes 1: Receiver, No sniff, 1 slot packets 2: Sender, No sniff, 5 slot packets 3: QoS, No sniff, All packet sizes, Short poll interval 4: Sniff, interval 10ms, 1 slot packets 5: Sniff, interval 50ms, 1 slot packets 6: Sniff, interval 100ms, 1 slot packets 7: Sniff, interval 200ms, 1 slot packets 8: Sniff, interval 500ms, 1 slot packets The link policies with sniff may be used to get a link with a specific response time or to decrease the power consumption. 9: Long range, DM1 packets 10: Long range, DM1 packets and QoS 11: Long range, all DM packets 12: Long range, all DM packets and QoS The link policies using only DM1 packets extend the range of the SPA on the cost of a decreased data throughput. Multipoint firmware QoS is not activated until maximum number of links is connected. This is to ensure that page scan is allowed and that every connection can be setup. If a link goes down the QoS is disabled until all links are setup again.
parameter	integer	This parameter has different meaning for different link policies. <i>Link policies with sniff (4-8):</i> Bit 0: Exit sniff on data activity. Only used when link policy supports sniff. If set the SPA will try to temporarily exit sniff when receiving data on the serial interface. When no data has been received on the serial interface for 1s, then the link will be put back into sniff mode. If not set, then the link will always be in sniff. Using exit sniff on data activity may be useful when using longer sniff intervals since these links have a low throughput. <i>Link policies with QoS (3,10,12).</i> If set to 0 then the shortest poll interval possible is used. If different from 0 then the value defines the poll interval. For the other link policies this parameter has no meaning and shall be set to 0.
store_in_startup_database	enumerator	0: The setting will only be valid for the current power cycle. 1: The Serial Port Adapter will remember the setting between power cycles. The settings database in the Serial Port Adapter will be updated.

Responses	Description
<CR><LF>OK<CR><LF>	Successful response
<CR><LF>ERROR<CR><LF>	Error message.

Model	Constraint
cB-OEMSPA13 cB-OEMSPA33	Not supported.

Read_Channel_Map (AT*AMCM?)

AT Command	Description
AT*AMCM? <CR>	Read static channel map. Does not include any changes caused by the adaptive frequency hopping. If needed, see Read_Dynamic_Channel_Map .

Responses	Description
<CR><LF>*AMCM: <channel0to15>, <channel16to31>, <channel32to47>, <channel48to63>, <channel64to78> <CR><LF>OK<CR><LF>	Successful response
<CR><LF>ERROR<CR><LF>	Error message.

Response Parameters	Type	Value
channel0to15	Integer	See Write_Channel_Map command.
channel16to31	Integer	See Write_Channel_Map command.
channel32to47	Integer	See Write_Channel_Map command.
channel48to63	Integer	See Write_Channel_Map command.
channel64to78	Integer	See Write_Channel_Map command.

Model	Constraint
cB-OEMSPA13 cB-OEMSPA33	Not supported.

Read_Dynamic_Channel_Map (AT*AMRCM=)

AT Command	Description
AT*AMRCM=<channel> <CR>	Read dynamic channel map.

Responses	Description
<CR><LF>*AMRCM:	Successful response

<channel0to15>, <channel16to31>, <channel32to47>, <channel48to63>, <channel64to78> <CR><LF>OK<CR><LF>	
<CR><LF>ERROR<CR><LF>	Error message.

Response Parameters	Type	Value
channel0to15	Integer	Bit mask used to enable or disable channels 0 to 15 (Bit 0 – Channel 0). Default value is 0xFFFF.
channel16to31	Integer	Bit mask used to enable or disable channels 16 to 31. Default value is 0xFFFF. (Bit 0 – Channel 16)
channel32to47	Integer	Bit mask used to enable or disable channels 32 to 47 (Bit 0 – Channel 32). Default value is 0xFFFF.
channel48to63	Integer	Bit mask used to enable or disable channels 48 to 63 (Bit 0 – Channel 48). Default value is 0xFFFF.
channel64to78	Integer	Bit mask used to enable or disable channels 64 to 78 (Bit 0 – Channel 64). Default value is 0xFFFF.