Rayson

Technology Co., Ltd.

www.rayson.com

SPP Firmware V6.28 User's Guide

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I. PIOs(programmable IOs) definition

PIO4, For connection/re-pair/restore button, high active. To press the button caused disconnection or reconnection. To double click the button caused clear all original link records then repairing. When user press the button more than 3 seconds, then it will restore the default RS232 setting. The device will enter DUT mode when the PIO4 hold high for 2 seconds during power up stage.
PIO5, For data led indication, high active. When data stream are trafficking
PIO6, For RFCOMM connection status, low active.
PIO7, For link led indication, high active.
PIO8, For power led indication, high active. When it's deep sleep the output is low.
PIO9, Output controled by ATS command
PIO3,PIO2,PIO11,PIO10 are reserved for Programmable I/O

The following is LED status information:

Status	Description
Link LED off	No pairing established.
Link LED fast (0.1 sec) blinking	Pairing (slave or master mode).
Link LED fast (0.3 sec) blinking	Discoverable and waiting for a connection (slave mode).
Link LED slow (0.9 sec) blinking	Inquiring (master mode).
Link LED very slow (1.2 sec) blinking	Connecting (master mode).
Link LED steadily on	Connection established.

SPP AT command sets:

+++(Escape Sequence with Guard Time)	When the device is in Data Mode, it can be forced back into online command Mode while maintaining the connection to the remote device.
O (Online	The command directs the device to switch from Command Mode to Data Mode, By the way, it is used to enable/disable auto-connection feature in master role.

Data Mode or Auto connect setting in master role)	*Modifiers*	*Description*
	O	Switch from command mode to Online data mode
	O0 (Default)	Automatically connecting to any available device or a device which is assigned in “ATD=xxxxxxxxxxxx”. (The command will cause reboot)
	O1	Disable auto-connection feature, user should manually use “ATA”command to connect a remote device. (The command will cause reboot)
	O?	Inquire the current setting
A (Establish a connection)	When it’s in master mode. This command establish a connection. When it’s in slave mode, the command will be rejected.	
	Modifiers	*Description*
	A	Connect to a Bluetooth device (It’s only available when “ATD= xxxxxxxxxxxx” assigned)
	A1~A8	Connect to a Bluetooth neighborhood device 1~8 (ATF? Result)
B (Display local BD address)	This command display the local device BD address	
	Modifiers	*Description*
	B?	Inquire the Local BD address
C (Flow Control)	This command enable or disable flow control signals (CTS/RTS) of the COM port. Note, the setting is not affected by ATZ0 and cause reboot.	
	Modifiers	*Description*
	C0	Disable flow control.(This command is not valid when it’s running DUN profile
	C1 (Default)	Enable flow control.
	C?	Inquire the current setting
D (Set Remote BD address)	We can specify the unique remote device can be connected. In master role, it automatically inquire and search the slave even the slave is undiscoverable. In slave role, the command should be as a filter condition to accept the master’s inquiry.	
	Modifiers	*Description*
	D=xxxxxxxxxxxx	"xxxx-xx-xxxxxx" is 12 digit hex symbol

	D0 (Default)	Clear Remote BD address setting, inquire any slave in master mode or accept any master in slave mode.
	D?	Inquire the Remote BD address setting
E (Local Echo)	This command specifies whether the device should echo characters received from the UART back to the DTE/DCE.	
	Modifiers	*Description*
	E0	Command characters received from the UART are not echoed back to the DTE/DCE.
	E1 (Default)	Command characters received from the UART are echoed back to the DTE/DCE.
	E?	Inquire the current setting
F (Find Bluetooth device)	This command is used to find any bluetooth device in neighborhood within 60 seconds timeout. If any device is found, its name and address will be listed. The search ends with a message “Inquiry ends, xx device(s) found.” This command is valid only when the device is in the master role and manual operation mode(ATO1). Note : One AT can cancel the searching at any time.	
	Modifiers	*Description*
	F?	Inquire scan Bluetooth neighborhood devices.
	F=nn	Set the maximum devices number, default is 8, is limited.
G (Power management control)	This command control deep sleep timer. The device will enter deep sleep mode whenever there are no any event activity and turn off all leds. The timer will restart once any event interrupt the timer. The device can wake up once UART or PIO4 receive a proper signal.	
	Modifiers	*Description*
	G=nnnnn	Deep sleep timer, nnnnn is 60~65536 seconds, the accuracy is +/-2 seconds.
	G=0 (Default)	Disable Deep sleep timer
	G?	Inquire the current setting
H (Drop a connection and Discoverable Control)	This command can drop the connection either master or slave role. By the way, it specifies whether the device could be discovered by remote master device.	
	Modifiers	*Description*
	H	Drop current connection

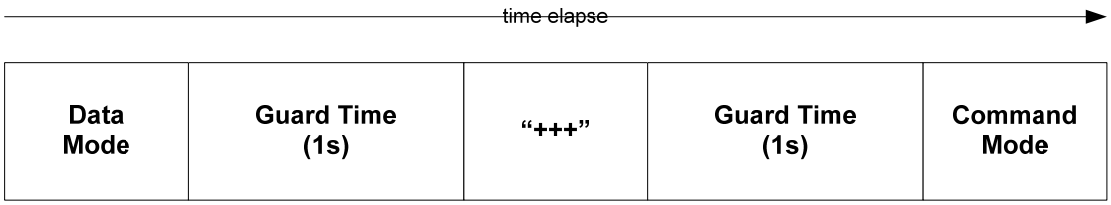
	H0	The device enters undiscoverable mode. If a pair have been made, the original connection could be connected again. Other remote master device can not discovery this device. (The command will cause reboot)
	H1 (Default)	The device enters discoverable mode. (The command will cause reboot)
	H?	Inquire the current setting
I (Information)	This command is used to Inquiry information	
	Modifiers	*Description*
	I0	Inquire the F/W version
	I1	Inquire the all settings list
	I2	Inquire the RSSI with value at Online Command mode.
	I?	Inquire the F/W version
K (Stop bits setting)	This command is used to specify one or two stop bits of COM port	
	Modifiers	*Description*
	K0 (Default)	One Stop bit
	K1	Two stop bits
	K?	Inquire the current setting
L (Baud Rate Control)	This command is used to specify the baud rate of COM port	
	Modifiers	*Description*
	L*	1200bps
	L#	2400bps
	L0	4800bps
	L1	9600bps
	L2 (Default)	19200bps
	L3	38400bps
	L4	57600bps
	L5	115200bps
	L6	230.4Kbps
	L7	460.8Kbps
	L8	921.6Kbps
	L?	Inquire the current setting

<table>
<tr><td>M
(Parity bits setting)</td><td colspan="2">This command is used to specify the parity bit setting of COM port</td></tr>
<tr><td></td><td>Modifiers</td><td>Description</td></tr>
<tr><td></td><td>M0
(Default)</td><td>None Parity bit.</td></tr>
<tr><td></td><td>M1</td><td>Odd parity setting.</td></tr>
<tr><td></td><td>M2</td><td>Even parity setting</td></tr>
<tr><td></td><td>M?</td><td>Inquire the current setting</td></tr>
<tr><td>N
(Set device name)</td><td colspan="2">We can specifies the device a friendly name using 0 to 9, A to Z, a to z, space and –, which are all valid characters. Note that "firs space or -, last space or – isn’t permitted". The default name is “Serial Adaptor”</td></tr>
<tr><td></td><td>Modifiers</td><td>Description</td></tr>
<tr><td></td><td>N=xxxxx</td><td>"xxxxx" is a character string, maxima length is 31</td></tr>
<tr><td></td><td>N?</td><td>Inquire the device name</td></tr>
<tr><td>P
(Set PIN code)</td><td colspan="2">This command specifies the PIN number. It control to off the PIN code authorization that allow to establish a connection without PIN code. The default PIN number is "1234"</td></tr>
<tr><td></td><td>Modifiers</td><td>Description</td></tr>
<tr><td></td><td>P=xxxx
(Default)</td><td>"xxxx" is 4~8 digit string</td></tr>
<tr><td></td><td>P0</td><td>Turn off the PIN code authorization</td></tr>
<tr><td></td><td>P?</td><td>Inquire the current PIN number</td></tr>
<tr><td>Q
(Result Code Supression)</td><td colspan="2">The command is used to determine if result Codes should be sent to the DTE/DCE. When result Codes are supressed, the device does not generate any characters in response to the completion of a command or when an event occurs.
Four Result Codes : OK,CONNECT,DISCONNECT,ERROR</td></tr>
<tr><td></td><td>Modifiers</td><td>Description</td></tr>
<tr><td></td><td>Q0
(Default)</td><td>The device will send out Result Codes.</td></tr>
<tr><td></td><td>Q1</td><td>The device will not send out Result Codes.</td></tr>
<tr><td></td><td>Q?</td><td>Inquire the current setting</td></tr>
<tr><td>R
(Set Role)</td><td colspan="2">This command specifies whether the device could be master or slave device. If change the role, the device will reboot and clear all paired records.</td></tr>
</table>

	Modifiers	*Description*
	R0	The device as SPP master role.
	R1 (Default)	The device as SPP slave role.
	R2	The device as DUN master role.
	R3	The device as DUN slave role.
	R?	Inquire the current setting
S (Program PIOs settings)	PIO9 signals setting	
	Modifiers	*Description*
	S0	Disable RS232 force on for auto power down.(PIO9 output low).
	S1 (Default)	Enable RS232 force on. (PIO9 output high)
	S?	Inquire the current setting
X (set Escape Sequence)	Disable/Enable escape sequence “+++” with 1 second guard time. The sequence was a command used to enter on line command mode from data mode.	
	Modifiers	*Description*
	X0	Disable Escape Sequence feature.(If the baud rate is higher than 230.4K, please disable the feature.)
	X1 (Default)	Enable Escape Sequence feature.
	X?	Inquire the current setting
U (F/W upgrade)	This command will prompt “Enter DFU mode, Are you sure (y/n)?”message, then press Y to confirm the command. Then you should connect USB cable to PC and run DFU wizard.	
	Modifiers	*Description*
	U=pass word	Pass word = RaysonUpgrade ,Enter F/W Upgrade Mode
Z (Application setting)	Restore different application setting and warm start.	
	Modifiers	*Description*
	Z0	Restore default setting.
	Z?	Inquire the current setting

Notes : All commands should follow with <CR> as ending.

The pattern to use escape mode



Notes:

1. Guard Time: is a timer of 1 second, it means that there is nothing inputted, keeps silence on the UART.
2. Typical steps to enter command mode:
    2.1. Input a non ‘+’ character to restart the guard timer, e.g. a CR character.
    2.2. Wait about 1s+X(ms), don’t input anything during this period, just wait.
    2.3. Input “+++” string, or input three ‘+’ one by one.
    2.4. Wait about 1s+X(ms), don’t input anything during this period, just wait.
    2.5. The BT module will response an “OK” to enter command mode.
3. X: to tune X parameter, it may be 50ms~100ms.

II. Pairing Feature

It can store pairing information for up to eight different device. Devices are stored in a “Paired Device List” in memory by chronological order. When an attempt to pair to more than eight devices is made, the oldest paired device is removed from the list. Any of the eight paired devices can make connection to the BT device, but only automatically initiate a paired connection with the last device it was connected to. Whichever of the eight devices initiate a connection to the BT device afterwards, that device then becomes the “last connected” device.