Promi-ESD01/ESD02™

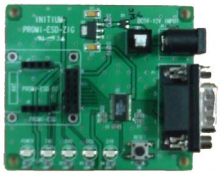
User Manual

Ver. 2.0 (2005.08.01)

by Bluetooth

Enabling Wireless Serial Communications

● Promi-SD/ESD Series

Bluetooth Serial Adapter	ESD01 	ESD02 	SD101 	SD202 	SD205 
Part Number	**IP11-320**	**IP11-321**	**IP10-300**	**IP10-301**	**IP10-302**
Description	Board-type wireless serial adapter with MMCX antenna connector	Board-type wireless serial adapter with on-board antenna	External type wireless serial adapter with internal battery	External type wireless serial adapter	External type wireless serial adapter with dip switch
Power Class	Class1	Class2	Class2	Class1	Class1
RF Range	Up to 100m	Up to 30m	Up to 30m	Up to 100m	Up to 100m
Power Connector	Header 2.54m	Header 2.54m	DC plug or 9 pin	DC plug or 9 pin	DC plug or 9 pin
Power supply	3.3V	3.3V	5V	5V~12V	5V~12V
Serial connector	2.54mm Header 2x6	2.54mm Header 1x4x2	Female DB9	Female DB9	Female DB9
Serial Interface	UART	UART	RS-232	RS-232	RS-232
Dip switch	No	No	No	No	Yes (4 slots)
Battery	No	No	Yes	No	No
Profile	Serial Port Profile	Serial Port Profile	Serial Port Profile	Serial Port Profile	Serial Port Profile
Applicable Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna
Bluetooth Qualified	Fully	Fully	Fully	Fully	Fully
Type Approved	FCC CE	FCC CE	TELEC MIC CE FCC	TELEC MIC CE FCC	MIC CE FCC
Dimensions (H×W×D)	27x27x14	18x20x11.7	62.5x31.2x16.3	62.5x31.2x16.3	62.5x31.2x16.3
Includes	Stub Antenna Antenna Cable (15cm)		Stub Antenna DC power cable AC/DC power adapter	Stub Antenna DC power cable	Stub Antenna DC power cable
Develop Board Set **ESD01 or ESD02 use only**	**DBS**  Jig Board + Power Adaptor + RS232 Cable **Part Number: IP30-500**				

● Promi-MSP Series

Wireless Multi-Serial Adapter	MSP102A 	MSP102B 
Part Number	**IP20-400**	**IP20-401**
Description	Wireless multi-serial adapter COM port redirector supported Serial/IP Up to 7 links simultaneously	Wireless multi-serial adapter COM port redirector supported Serial/IP Up to 14 links simultaneously
Power Class	Class1	Class1
RF Range	Up to 100m	Up to 100m
Power Connector	DC plug	DC plug
Power supply	5V	5V
Serial connector	Male DB9	Male DB9
Serial Interface	RS-232	RS-232
Dip switch	No	No
Battery	No	No
Profile	LAN Access Dial-up Serial Port Profile	LAN Access Dial-up Serial Port Profile
Applicable Antenna	Stub Antenna Dipole Antenna Patch Antenna	Stub Antenna Dipole Antenna Patch Antenna
Bluetooth Qualified	Fully	Fully
Type Approved	MIC CE FCC	MIC CE FCC
Dimensions (H×W×D)	147x112x32	147x112x32
Includes	Dipole Antenna AC/DC Power Adapter RS232 Cable LAN Cable Mounting Kit CD	Dipole Antenna AC/DC Power Adapter RS232 Cable LAN Cable Mounting Kit CD Bluetooth USB Adapter

Accessories

Antenna	**SAT** 	**DAT** 	**PAT** 	**EAT** 
	IA60-800	**IA60-801**	**IA60-802**	**IA60-820**
	Stub (30mm)	Dipole (120mm)	Patch (130×90×65mm)	Board type (18×6×7mm) ESD01 use only
Power Supply	**EPA** 	**OPA** 	**UPA** 	**DPA** 
	IA70-840	**IA70-841**	**IA70-860**	**IA70-861**
	External Power Adaptor Domestic use only	External Power Adaptor International use	USB power cable	DC power cable
Extension Cable	**RFC** 	**EEC** 	**SPC** 	
	IA80-880	**IA80-881**	**IA80-882**	
	Antenna extension cable (1m)	Antenna extension cable (15cm) ESD01 use only	Serial power cable + Power adapter	

↘ For more information, please contact:

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Welcome

Thank you for purchasing Promi-ESD products.

Promi-ESD is a module for wireless serial communication using Bluetooth technology, the international standard for short range wireless communications. Its interoperability and credibility delivers the maximum benefits of wireless communication.

This user manual is designed to help you use the Promi-SD series properly. It is important that you read the manual to ensure that you get the most out of your products.

Thank you.

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Precautions and Safety

↘ Product

- ☑ Do not drop or subject the module to impact. Damage to your products may result from improper use.
- ☑ Keep away from harsh environments including humid, dusty, and smoky areas. Damage to your ESD may result from improper use.
- ☑ Do not place heavy objects on the product. Damage to your products may result from improper use.

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1. Getting Started

- Features of Promi-ESD
- Components
- Specifications

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Features of Promi-ESD

↘ Reliability and Interoperability

Promi-ESD is a module device for wireless serial communication using the Bluetooth technology that is international standard of short range wireless communications. Promi-ESD accomplishes more reliable wireless communication. As Promi-ESD can communicate with other Bluetooth devices, user may construct various communications with it.

Promi-ESD provides several models with different communication ranges from 30m (Promi-ESD02) up to 100m (Promi-ESD01) for user's various applications. In terms of noise, Promi-ESD delivers better quality of communication than standard RS232 cables.

↘ Compact Design

Promi-ESD has the most compact design of the same kind devices and can be placed conveniently into any devices or equipments. Its detachable antenna of variety optimizes the quality and distance of wireless communications.

↘ Easy Configuration and Adaptation

Promi-ESD can be configured and controlled by typical AT commands. User can easily configure Promi-ESD on the terminal program such as HyperTerminal and implements the wireless communication without modifying user's existing serial communication program. In addition to the basic AT commands, Promi-ESD provides some expanded AT commands for its various functions.

User friendly PromiWIN are also provided for easy setup on Microsoft Windows.

↘ Security

The FHSS (Frequency Hopping Spread Spectrum) technique of Bluetooth lets Promi-ESD have less radio interference and no danger of hacking in air. Promi-ESD also supports authentication and data encryption.

Components

Promi-ESD01

Stub Antenna

Antenna Cable

Promi-ESD01

Promi-ESD02

Promi-ESD02

Please check the components of Promi-SD in Fig. 1-1 when purchasing. The picture of product may differ by models. The components of the package may change for improving product capacity or quality without notice.

Specifications

	Specification	
Model name	Promi-ESD01™	Promi-ESD02™
Input Voltage	DC 3V~3.3V	DC 3V~3.3V
Bluetooth Spec	Bluetooth™ Specification v1.1	Bluetooth™ Specification v1.1
Transmission Power	16dBm(Class 1)	Max +4dBm(Class 2)
RF Range	Max 100m (Default Antenna)	Max 30m (Default Antenna)
Baud rate	1200 ~ 230000bps	1200 ~ 230000bps
Power Consumption	75mA (input DC 3.3V)	48mA (input DC 3.3V)
Operating Temperature Range	-10 ~ 70°	-10 ~ 70°
Radio Frequency	2400㎒ ~ 2483.5㎒	2400㎒ ~ 2483.5㎒
Number of Channels	79	79
Dimensions (H×W×D)	27 x 27 x 14(mm)	18 x 20 x 11.7 (mm)
Applicable Antenna	2.4GHz stub Antenna, Dipole Antenna, Patch Antenna	2.4GHz Board Type Antenna

2. Configurations

- Operation Modes
- Serial Ports
- PromiWIN™
- Terminal Program

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Operation Modes

In addition to the serial port configurations such as bit/second, data bit, parity, stop bit, flow control, Promi-ESD has some configurations for Bluetooth. For getting the most out of Promi-ESD, user should understand the following Bluetooth connection schemes.

A Bluetooth device can play a role as a master or slave. Master tries to connect itself to other Bluetooth device, and slave is waiting to be connected from other Bluetooth devices. A Bluetooth connection is always made by a pair of master and slave. A slave can be in two modes, Inquiry Scan or Page Scan mode. Inquiry Scan mode is waiting the packet of inquiry from other Bluetooth devices and Page Scan mode is waiting the packet of connection from other Bluetooth devices. Every Bluetooth device has its unique address, called BD (Bluetooth Device) address, which is composed of 12 hexa-decimal numbers.

Promi-ESD has 4 operation modes as follows.

↘ MODE 0

Promi-ESD must be in Mode0, when it is directly controlled by AT commands.

In this mode, there is no response when power on or software reset, and Promi-ESD is just waiting for AT command input. Neither master nor slave is assigned to Promi-ESD in mode0. User can change the configurations of Promi-ESD in this mode.

The factory default is set to Mode0.

↘ MODE 1

Promi-ESD tries to connect the last connected Bluetooth device.

Promi-ESD in Mode1 is to be a master and tries to connect the last connected Bluetooth device. Promi-ESD always stores the BD address of the Bluetooth device to which Promi-ESD has connected last time. When Promi-ESD is initially used or after hardware reset, there is no BD address stored in Promi-ESD. In this case, Mode1 does not make any sense and mode change from other operation modes to Mode1 is not allowed. The mode change to Mode1 can be made after Promi-ESD succeeds to connect to other Bluetooth device in Mode0. Once changed to Mode1, Promi-ESD will try to connect automatically the last connected Bluetooth device whenever power on or software reset.

Promi-ESD in Mode1 cannot be discovered or connected by other Bluetooth devices.

↘ MODE 2

Promi-ESD is waiting for the connection from the last connected Bluetooth device.

Promi-ESD in Mode2 is to be a slave and waiting for the connection only from the last connected Bluetooth device. Just like Mode1, if there is no BD address stored in Promi-ESD, the mode change from other operation modes to Mode2 is not allowed. Once changed to Mode2, Promi-ESD will wait for the connection from the last connected Bluetooth device whenever power on or software reset.

Promi-ESD in Mode2 cannot be discovered or connected to Bluetooth devices other than the last connected device.

↘ MODE 3

Promi-ESD is waiting for the connection from any other Bluetooth devices.

Promi-ESD in Mode3 acts like in Mode2, but allows any connection from other Bluetooth device. Most of general Bluetooth device is set to Mode3.

Promi-ESD in Mode3 can be discovered and connected from any other Bluetooth devices.

Serial Ports

The applicable settings for serial ports are as follows.

Serial Port Settings	Values
Baud rate	1200, 2400, 4800, [9600], 19200, 38400, 57600, 115200, 230400
Data bit	[8]
Parity	[No parity], Even parity, Odd parity
Stop bit	[1], 2
Hardware Flow Control	[Use], No use

The values in box are the factory defaults.

↘ Data Bit

Promi-ESD supports only 8 data bit. In the case of 7 data bit, please contact the technical support.

↘ Hardware Flow Control

Promi-ESD plugged into its host system transmits data from host to the other side Bluetooth device. These data is saved temporarily in the internal buffer of Promi-ESD and sent repeatedly until the transmission is completed packet by packet. When the radio transmission condition is not good enough to send data promptly, it can cause the transmission delay. If the host sends more data when the buffer is full, buffer overflow will make Promi-ESD malfunction consequently. In order to prevent this buffer overflow, Promi-ESD works as follows.

In case of using hardware flow control, Promi-ESD makes RTS be 'disable' to stop receiving further data from the host when the buffer becomes full. RTS will be 'able' to begin receiving data again from the host when the buffer has some room for more data.

In case of not using hardware flow control, Promi-ESD clears the buffer to secure the room for next data when the buffer becomes full. This means the loss of data. As the transmission data becomes large, the possibility of data loss goes higher.

For large data transmission, use of hardware flow control is highly recommended.

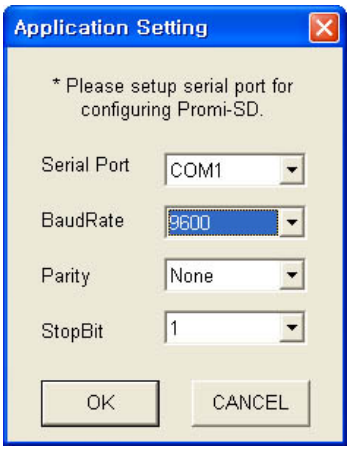
If you are not using Hardware flow control (handshaking), please bridge CTS and GND to disable the function.

Configuration Software

Configuration Software	Usage	Operating Platform
PromiWIN	Individual setup of Promi-ESD	MS Windows 98SE or higher

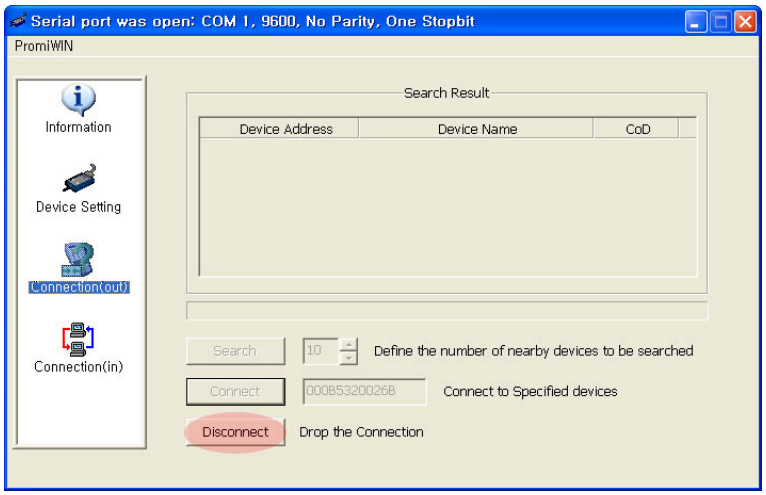
PromiWIN

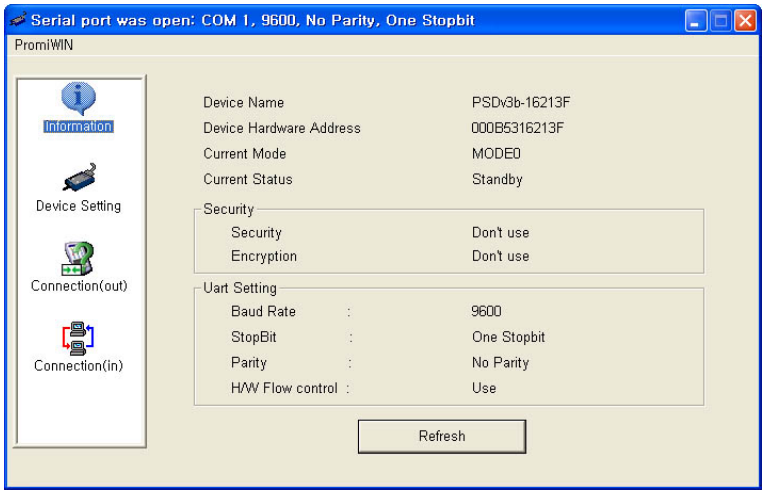
PromiWIN is a program running on Microsoft Windows for the configuration of Promi-ESD. Install PromiWIN on your computer. Plug a Promi-ESD into the serial port using RS232 jig board and turn on the power. Run PromiWIN.



Set each option properly and click [Confirm]. If the settings are different from the host computer, error message will pop up. If the Promi-ESD is in the status of connection, warning message will pop up.

Then the current connection can be cancelled by [Disconnect] button on the main window.

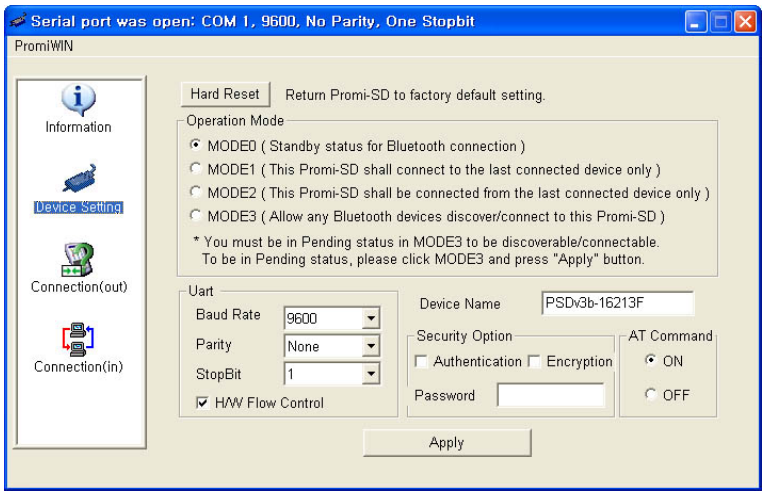




Serial port settings can be changed by <Start Configuration> and <PromiWIN Configuration> of PromiWIN in the menu bar at upper left corner of the window without re-running the PromiWIN program.

The icons in the left side window come to the corresponding windows.

In device configuration window, hardware reset can be executed or operation mode and RS232 can be configured as well. Security option also can be configured in this window.

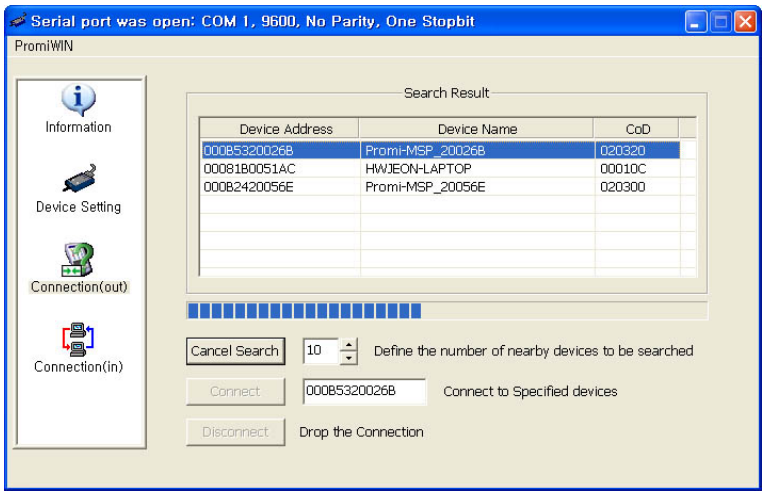


Promi-ESD has 4 response messages, 'OK', 'ERROR', 'CONNECT', and 'DISCONNECT'. In some cases, these responses can affect the host system unexpectedly. To prevent this, user can set the response to ON or OFF. (AT Command)

For Promi-ESD, hardware flow control can be configured only by bridge CTS and GND. Thus H/W Flow Control option will not work in this case.

Click [Apply] button to reflect the given options to Promi-ESD actually.

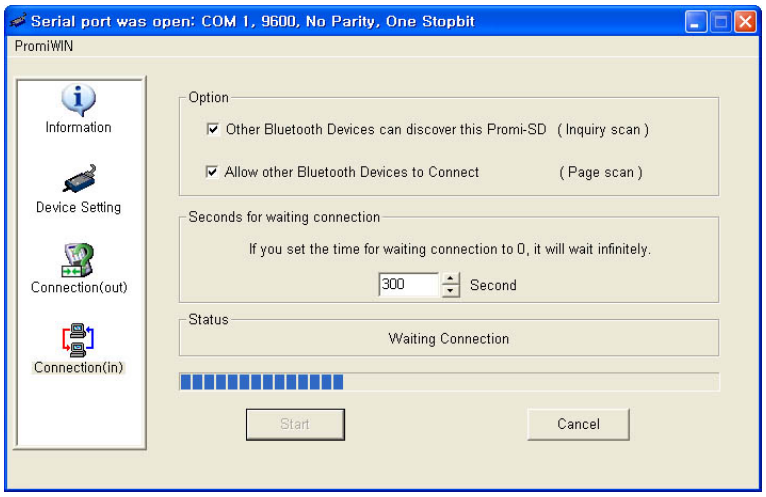
Connect icon will show the following window to search and connect other Bluetooth devices.



Click [Search] button to search nearby Bluetooth devices. The maximum number of devices to be searched can be controlled. Select one of the devices searched and click [Connect] button. The selected Bluetooth device must be in Page scan mode. Click [Disconnect] button to cancel the connection normally.

Connection(in) icon will show the following window to make Promi-ESD wait to a connection from the other Bluetooth device. The waiting time in seconds can be

controlled. With 0 input for this waiting time, Promi-ESD keeps waiting for connection until [Cancel] button is clicked.



Terminal Program

A terminal program is an application that will enable a PC to communicate directly with a modem. If you are using Windows 98SE or higher version of Windows, HyperTerminal program as it is included as part of the operating system. Promi-ESD provides some extended AT commands for its configurations on terminal program.

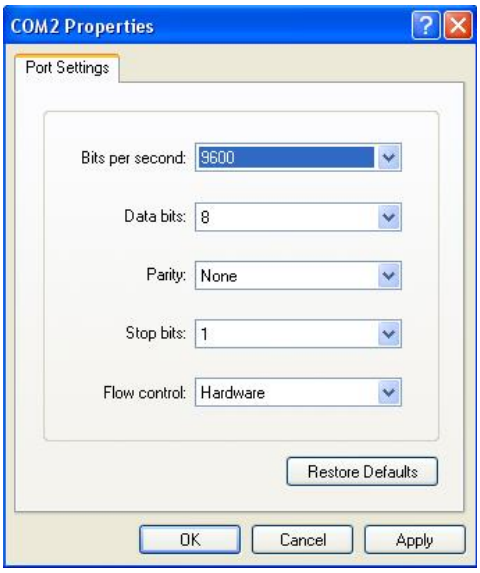
This manual will explain the method using HyperTerminal. If you need to install HyperTerminal, click start>setting>control panel>add/remove programs. For more precise information, please refer to Help of Microsoft Windows.

Attach Promi-ESD to serial port of host computer and power on.

Launch HyperTerminal. It can be found in start >programs >accessories >communication >HyperTerminal. Select the Serial port that Promi-ESD will be connected to.

Input the same settings into Serial port configuration window as Promi-ESD settings.

The settings need to be set correctly, otherwise, error message may be shown up on the screen or cause malfunctioning of Promi-ESD.



Choose the settings in File->Properties->Settings->ASCII setup that let you turn echo on in HyperTerminal; this will show the response Promi-ESD sends on the screen.

You now get the HyperTerminal window where you are able to control Promi-ESD with AT commands. For expanded AT commands that Promi-ESD provides, please refer to Appendix A. AT commands.

Example of AT commands:

```
                        AT+BTINFO?
000B53000509,PSDv2a-000509,MODE0,STANDBY,0,0,HWFC

OK
AT+BTINQ?
000B5320007E,PSDv2a-20007E,001F00

0004B300E205,AP2002:1 #0,020300

OK
ATD000B53000509
OK

CONNECT 000B53000509
```

3. Connections

● Promi-ESD Pin Assignment

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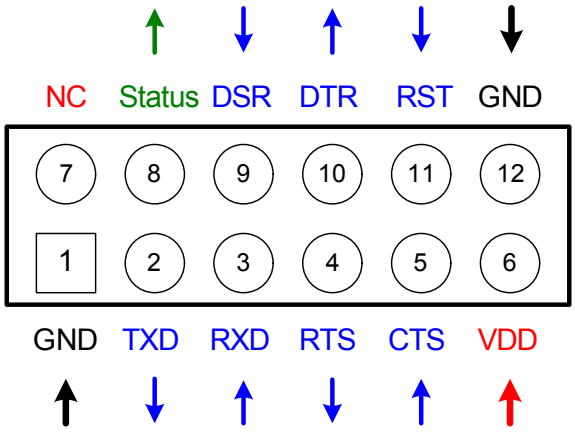
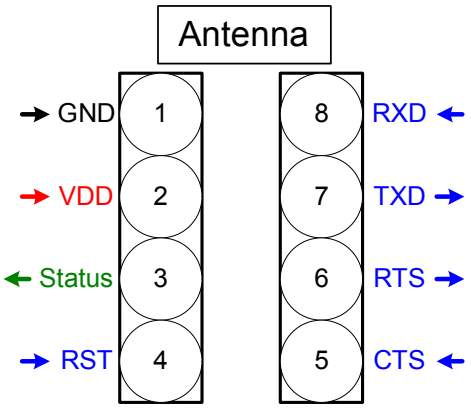
Promi-ESD Pin Assignment

↘ Pin Assignment (Promi-ESD01)



Pin no.	Pin name	Direction	Description	Signal Level
1	GND	I	Power Ground	Ground
2	TXD	O	UART data out	TTL
3	RXD	I	UART data input	TTL
4	RTS	O	UART Ready to Send	TTL
5	CTS	I	UART Clear to Send	TTL
6	VDD	I	DC input (3.0 ~ 3.3V)	Power
7	NC	I	No Connection	-
8	Status	O	Bluetooth Connect Detect (Active Low)	TTL
9	DSR	I	Data Set Ready	TTL
10	DTR	O	Data Terminal Ready	TTL
11	RST	I	Reset (Active Low)	TTL
12	GND	O	Power Ground	Ground

↘ Pin Assignment (ESD02)



Pin no.	Pin name	Direction	Description	Signal Level
1	GND	I	Power Ground	Ground
2	VDD	I	DC input (3.0 ~ 3.3V)	Power
3	Status	O	Bluetooth Connect Detect (Active High)	TTL
4	RST	I	Reset (Active Low)	TTL
5	CTS	I	UART Clear to Send	TTL
6	RTS	O	UART Ready to Send	TTL
7	TXD	O	UART data out	TTL
8	RXD	I	UART data input	TTL

RTS/CTS : RTS and CTS signal will be used for Hardware Flow Control of Promi-ESD.

Promi-ESD RTS → CTS

Promi-ESD CTS → RTS

If you are not using Hardware flow control (handshaking), please bridge CTS and GND to disable the function.

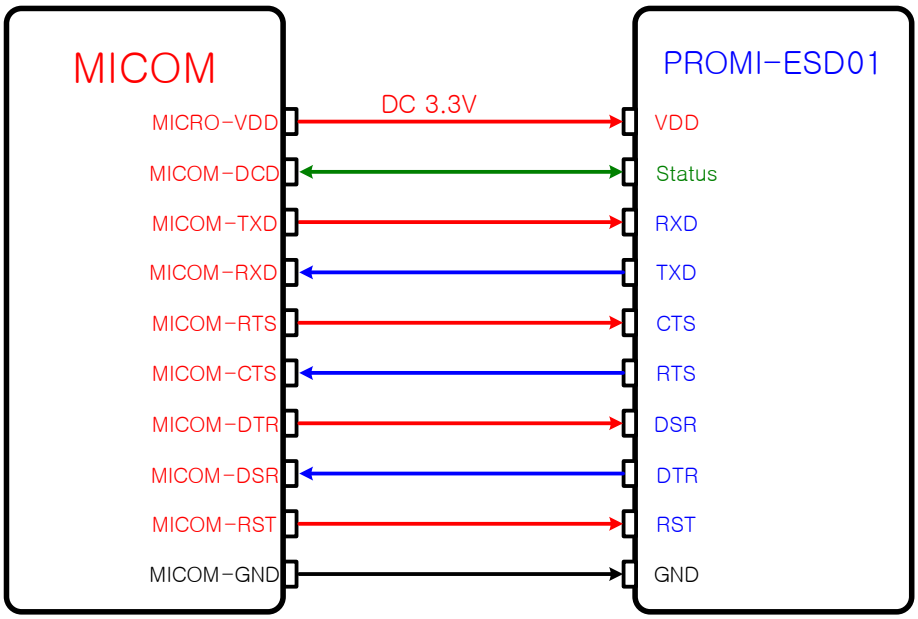
DCD : Status of Bluetooth connection will be delivered to Host PC via DCD line. When Bluetooth connection is made, DCD signal will be in state OFF. For disconnection of Bluetooth, DCD signal will become state ON.

Connection Module → low signal

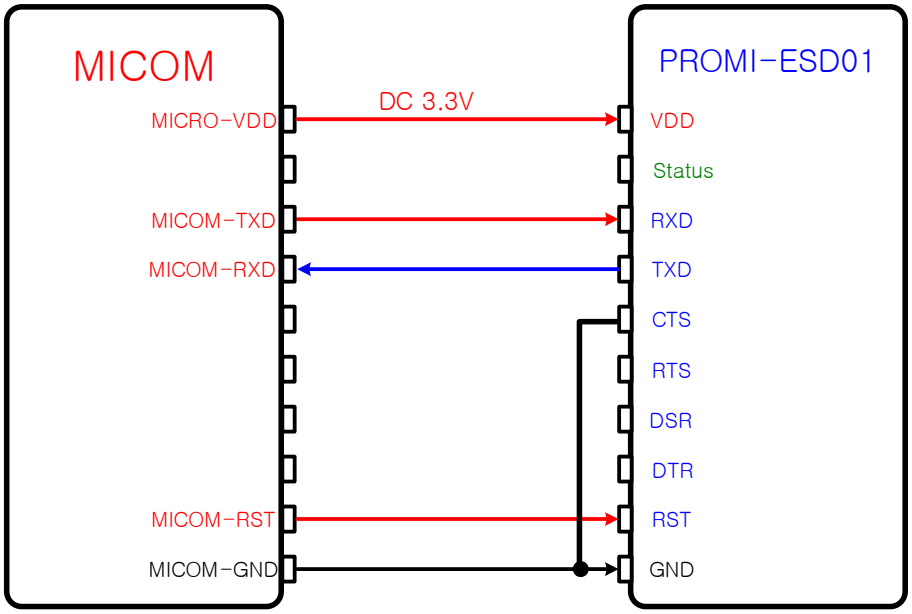
RST(Reset) : RST signal will be used for initialization of Promi-ESD. RST should be on 0V status for at least 1 second for this.

Promi-ESD01

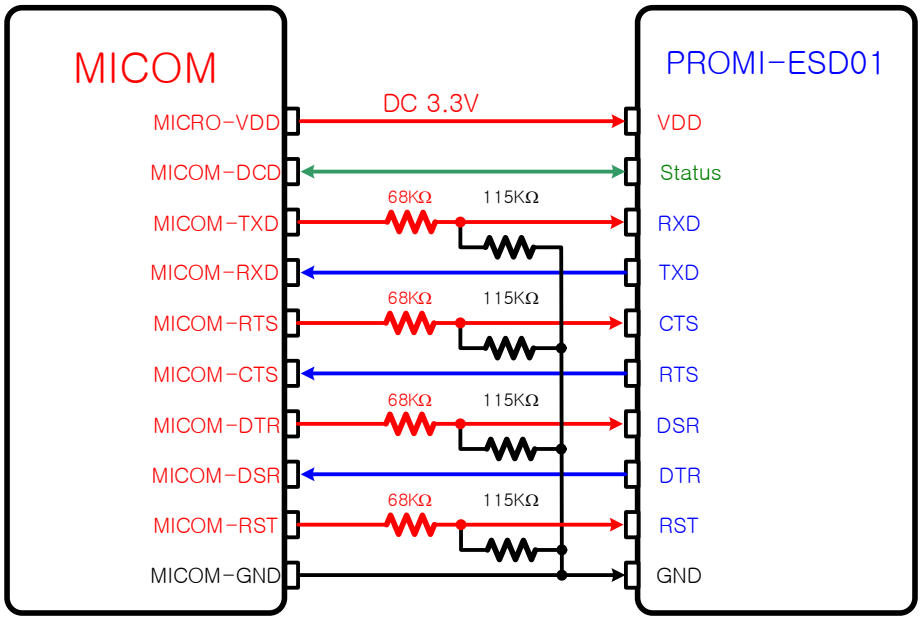
↘ **When TTL level of MICOM is 3.3V**

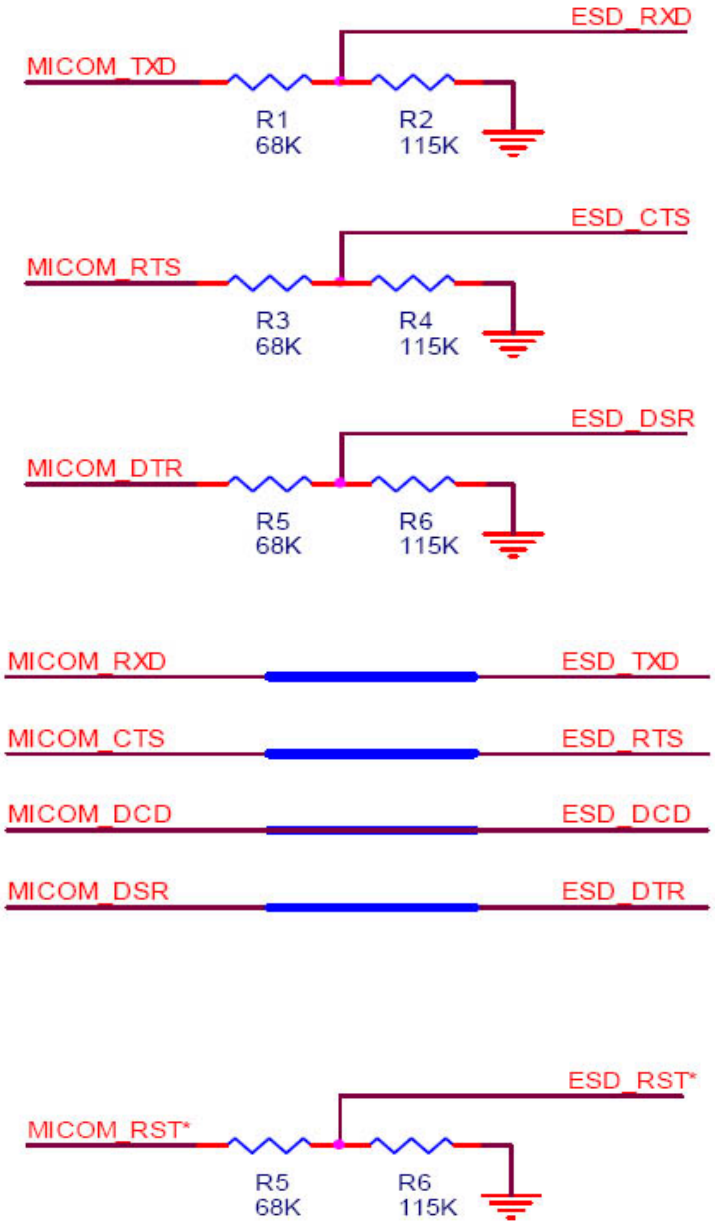


↘ **When TTL level of MICOM is 3.3V and not using hardware flow control.**



↘ **When TTL level of MICOM is 5V**

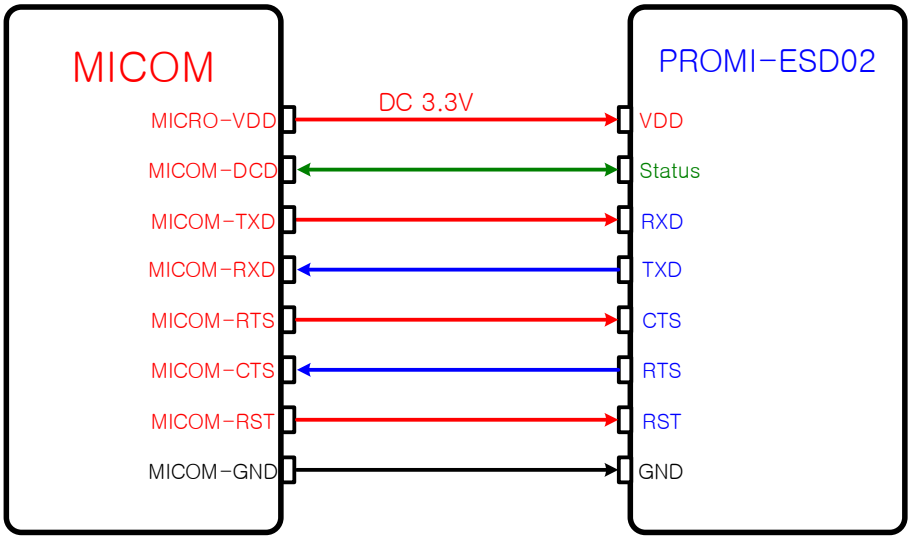




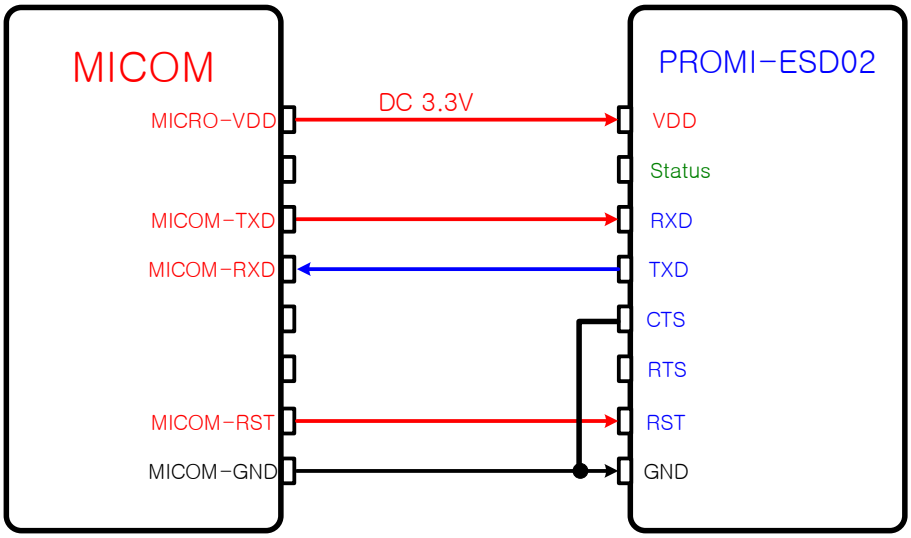
If you are using Reset.

Promi-ESD02

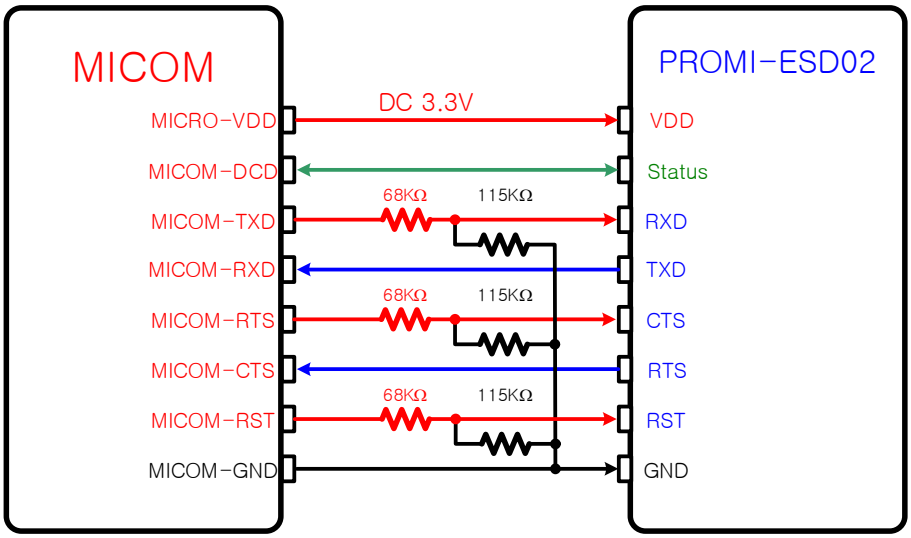
↘ **When TTL level of MICOM is 3.3V**



↘ **When TTL level of MICOM is 3.3V and not using hardware flow control**



↘ **When TTL level of MICOM is 5V**



4. Trouble Shooting

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No Data Transmission

↘ COM Port Settings

Check whether the Baud rate of Promi-ESD is same as that of its host equipment. If you do not know the current Baud rate of Promi-ESD, initialize it to 9600 by pressing Reset.

Check whether the Data bit is set to 8. Promi-ESD supports only 8 Data bit. If your host equipment uses 7 Data bit and even or odd parity, it can work as if it uses 8 Data bit and No parity. This is valid only when both DCE devices are Promi-ESD. In this case, set both Promi-ESDs to 8 Data bit and No parity. If one of DCE devices is other Bluetooth device such as Bluetooth USB dongle, please contact Technical Support.

Check whether the Parity and Stop bit of Promi-ESD are same as those of its host equipment. Promi-ESD supports No parity, Even parity and Odd parity, 1 and 2 Stop bit.

Check whether the host equipment of Promi-ESD uses Hardware Flow Control. Promi-ESD is initially set to Use of Hardware Flow Control. If your host equipment does not use Hardware Flow Control, set the Hardware Flow Control of Promi-ESD to No use.

And Promi-ESD does not support RS-232 break signal.

Data Loss or Malfunctioning

↘ Hardware Flow Control

When transmitting large data with No use of Hardware Flow Control, Promi-ESD will clear the data buffer unexpectedly. This possibility goes higher as the RF transmission environment is bad.

↘ ESD Response

The messages of ESD response may affect the function of host system. Set ATS10=0 not to send ESD response to host system and try again. Refer Appendix B. for details.

Transmission Delay

↘ RF Processing Delay

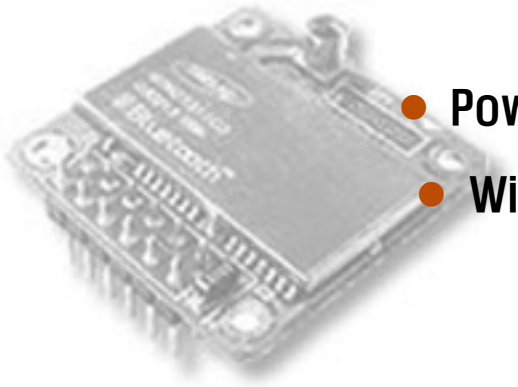
It takes 30msec approximately for a Promi-ESD to complete the data transmission to the other side Bluetooth device. This time delay cannot be reduced and would be bigger as the RF transmission environment is bad. Do not use Promi-ESD If your applications cannot allow this time delay.

↘ RF Transmission Environment

If there are lots of Bluetooth device working in a small area and/or the RF communication distance is too long and/or there are some obstacles affecting RF performance, Promi-ESD repeats the transmission packet by packet due to interferences and/or low RF performance. This leads the transmission time delay.

5. Specifications

- Bluetooth
- Interface
- Power
- Mechanical Dimensions
- Environmental
- Default Antenna
- VDD
- Power Consumption
- Wireless Coverage



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BLUETOOTH

↘ Bluetooth Interface

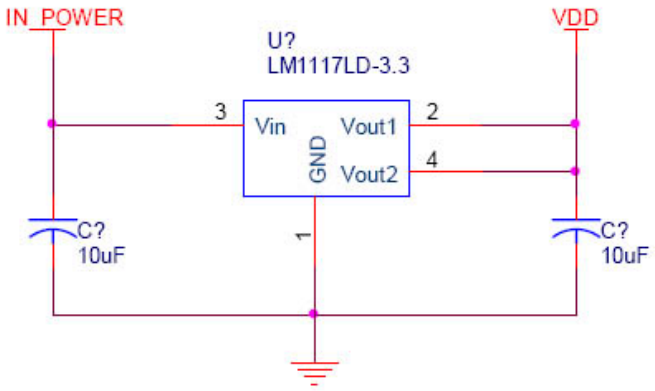
- ☑ Bluetooth 1.1 specification compatible and qualified
- ☑ Protocol: RFCOMM, L2CAP, SDP
- ☑ Profiles: Serial Port Profile
- ☑ Radio Frequency: 2.4 ~ 2.4738GHz
- ☑ Number of Channels: 79
- ☑ Transmission Power Class 2 (Promi-ESD02)
- ☑ Transmission Power Class 1 (Promi-ESD01)
- ☑ Data Transmission Rate: 380Kbps Max.

↘ UART Interface

- ☑ Output Interface UART
- ☑ Connector: 2.54mm Header 2x6 (ESD01), 2.54mm Header 1x4x2 (ESD02)
- ☑ Data Transmission Rate: 1,200 ~ 230,400 bps
- ☑ Hardware Flow Control: On/Off

↘ Power

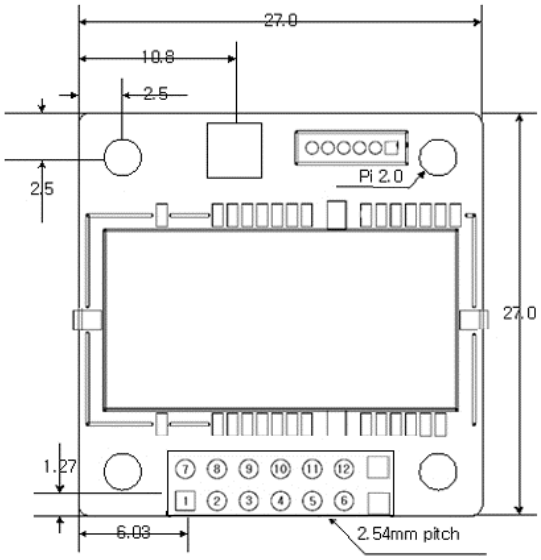
- ☑ DC 3.3V Constant Voltage
- ☑ If you are using DC3.3V from DC5~12V, must be using upper 150mA regulator. (LDO of general 1117 is compatible with ESD .)
- ☑



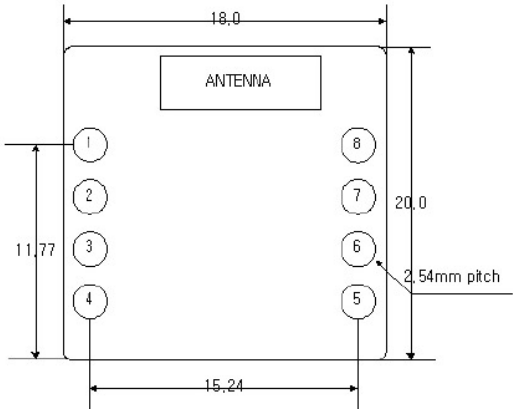
- ☑

☑

↘ Mechanical Dimensions



Promi-ESD01



Promi-ESD02

↘ Environmental

Recommended Operational Temperature: −20℃ ~ 70℃

Recommended Operational Humidity: 90% Max. Non-condensing

↘ Default Antenna (ESD01 default, ESD02 option)

- ☑ Type: Helical
- ☑ Frequency: 2,400 ~ 2,485GHz
- ☑ Gain: Max. 1dBi ±1
- ☑ Impedance: 50Ω
- ☑ size: 30mm×9mm (W×D)
- ☑ weight: 3.5g

↘ Power Consumption

Recommended Operating Conditions		
Operating Condition	Min	Max
Operating Temperature Range	-20°C	70°C
VDD	3.0V	3.6V

For safe operation, supply power of 3.3V.

Input/Output Terminal Characteristics (Promi-ESD01)				
Digital Terminals	Min	Typ	Max	Unit
Input Voltage				
VIL input logic level low (VDD=3.0V)	-0.3	-	0.8	V
VIH input logic level high	0.7VDD	_	VDD+0.3	V
Output Voltage Input				
VOL output logic level low (IO = 4.0mA)	_	_	0.2	V
VOH output logic level high (IO = -4.0mA)	VDD-0.3	_	_	V

Input/Output Terminal Characteristics (Promi-ESD02)				
Digital Terminals	Min	Typ	Max	Unit
Input Voltage				
VIL input logic level low (VDD=3.0V)	-0.4	-	0.8	V
VIH input logic level high	0.7VDD	_	VDD+0.4	V

Output Voltage Input				
VOL output logic level low (IO = 4.0mA)	–	–	0.2	V
VOH output logic level high (IO = -4.0mA)	VDD-0.2	–	–	V

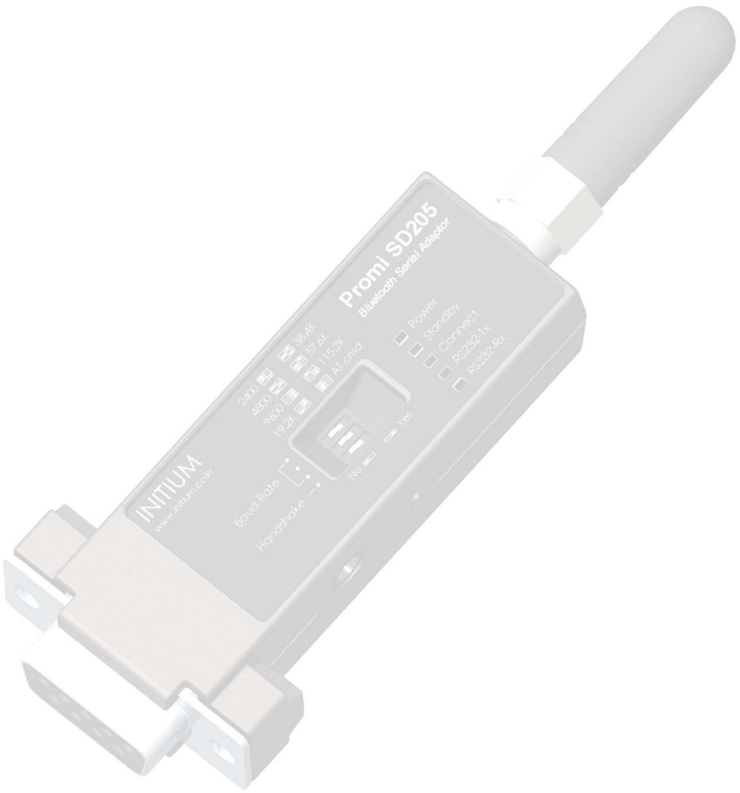
↘ Wireless Coverage

The table below shows the average measuring results in open space. These results can vary according to the environmental conditions.

Antennas for two Promi-ESD units	Maximum Distance [Meter] (ESD01)	Maximum Distance [Meter] (ESD02)
Board type Antenna(ESD02 default)		30m
Stub Antenna - Stub Antenna	100m	30m
Stub Antenna - Dipole Antenna	150m	50m
Dipole Antenna - Dipole Antenna	200m	80m
Patch Antenna - Dipole Antenna	400m	150m
Patch Antenna - Patch Antenna	1000m	300m

Appendix A. AT Commands

- Terminology
- Command Category
- Command Description
- Command Validity



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Terminology

↘ AT Command

AT command set is the de facto standard language for controlling modems. The AT command set was developed by Hayes and is recognized by virtually all personal computer modems. Promi-ESD provides the extended AT command set to control and configure the serial parameters and Bluetooth connection.

↘ AT Response

Promi-ESD replies to AT commands with 4 kinds of message, 'OK', 'ERROR', 'CONNECT' and 'DISCONNECT'.

↘ Operation Mode

- Mode0: Waiting for AT commands
- Mode1: Attempting to connect to the last connected Bluetooth device
- Mode2: Waiting for the connection from the last connected Bluetooth device
- Mode3: Waiting for the connection from any other Bluetooth devices

↘ Operation Status

- Standby: Waiting for AT commands
- Pending: Executing tasks
- Connect: Transmitting data

↘ Security

- Authentication: Pin code (or Pass key)
- Encryption: Data encryption

↘ Symbols

The symbols are used for the description of command syntax as follows:

Symbol	Meaning	ASCII Code
↵	Carriage return	0x0D
↙	Line feed	0x0A
↯	Carriage return + Line feed	
112233445566	Bluetooth device address	
n or m	One digit decimal number	

to	Timeout in second

Command Category

Command Category		Index	AT commands
RESET		1	ATZ
		2	AT&F
SERIAL PORT		3	AT
		4	AT+UARTCONFIG,b,p,s
BLUETOOTH	Information	5	AT+BTINFO?
		6	AT+BTINQ?
		7	AT+BTLAST?
	Mode	8	AT+BTMODE,n
	Status	9	+++
		10	AT+SETESC,nn
		11	ATO
		12	AT+BTCANCEL
		13	AT+BTSCAN
		14	AT+BTSCAN,n,to
		15	AT+BTSCAN112233445566,to
	Connection	16	ATD
		17	ATD112233445566
		18	ATH
	Security	19	AT+BTKEY=$string
		20	AT+BTSD?
		21	AT+BTCSD
		22	AT+BTFP,n
		23	AT+BTSEC,a,e
	Miscellaneous	24	AT+BTNAME=$string
		25	AT+BTLPM,n
S-REGISTER		26	AT&V
		27	ATSnn?

28	ATSnn=mm

Command Description

1 ATZ↵

Response	↯OK↯
Purpose	Software Reset
Description	This is the same effect as power off and on. This command disconnects Bluetooth device, and stops ongoing task. After rebooting, the status is decided by the preset operation mode. Some AT commands need ATZ to take effect.
Reference	AT&F, AT+BTCSD, AT+UARTCONFIG

2 AT&F↵

Response	↯OK↯
Purpose	Hardware reset
Description	This is the same effect as initialization by reset button. All parameters are initialized to factory defaults. The storage of Promi-SD is cleared completely.
Reference	ATZ

3 AT↵

Response	↯OK↯
Purpose	Check the connection status with host equipment
Description	Check if the connection to host equipment is normal. The serial parameters of Promi-SD must be same as those of host equipment. If not, SD response is none or 'ERROR' or abnormal sequence of strings.
Reference	AT+UARTCONFIG, ATZ, AT&F

4 AT+UARTCONFIG,Baudrate,Parity,Stopbit↵

Response	↯OK↯

Purpose	Set Serial parameters
Parameters	*Baudrate*= 1200/2400/9600/14400/19200/38400/57600/115200/230400 (Default=9600) *Parity*=N/E/O (Default=N) *Stopbit*=1/2 (Default=1)
Description	The Serial parameters can be set or changed. The factory default is 9600, N, 1. To take effect of this command, ATZ or power off and on.
Reference	AT, ATZ, AT&F, ATS

5 AT+BTINQ? ↵

Response	↯112233445566,FriendlyName,CoD↯ ↯112233445566,FriendlyName,CoD↯ ↯112233445566,FriendlyName,CoD↯ ↯OK↯
Purpose	Search Bluetooth devices nearby
Description	The Bluetooth devices in Inquiry scan mode nearby are displayed with their BD addresses, Device names, and Class of device. Maximum 10 devices are scanned for 30 seconds.
Reference	AT+BTSCAN, ATD, AT+BTINFO?

6 AT+BTLAST? ↵

Response	↯112233445566↯ ↯OK↯
Purpose	Display the BD address of the last connected device
Description	The Bluetooth device connected to this Promi-SD last time is displayed with its BD address.
Reference	AT+BTSCAN, ATD, AT+BTINFO?, AT+BTINQ?

7 AT+BTMODE,*n*↵

Response	↯OK↯
Purpose	Set operation mode

Parameters	*n*=0: MODE0 (Default) *n*=1: MODE1 *n*=2: MODE2 *n*=3: MODE3
Description	When the operation status is 'Pending' currently, change the status to 'Standby' with AT+BTCANCEL prior to this command. To take effect of this command, ATZ or power off and on.
Reference	AT+BTINFO?
Example	AT+BTMODE,2 ↯OK↯ ATZ

8 +++

Response	↯OK↯
Purpose	Convert the operation status of 'Connect' to 'Standby'
Description	In 'Connect' status, data from host is transmitted to the other side Bluetooth device, and any AT command is not accepted but this command, which is not echoed on the screen. When Promi-SD encounters a character '+' from host, it stops the data transmission and waits for next 2 characters. If the next 2 characters are both '+', it restart to transmit data including the first '+' as well. If not, it converts the operation status to 'Standby'. If the data from host includes '+++', it will convert the operation status to 'Standby' unexpectedly. Notice that Promi-SD holds data transmission when it encounters '+', until receiving next character. '+' is an escape sequence character by default, which is changeable by AT+SETESC.
Reference	AT+SETESC, ATO, AT+BTCANCEL

9 AT+SETESC,*nn*↵

Response	↯OK↯
Purpose	Change the escape sequence character
Parameters	*nn*=Decimal number of ASCII code (Default=43)

Description	Escape sequence character set to '+' by default is changeable. The parameter *nn* must be a printable character.
Reference	+++, ATO
Example	AT+SETESC,42

10 ATO↵

Response	None
Purpose	Convert the operation status of 'Standby' to 'Connect'
Description	You can convert the operation status of 'Standby' to 'Connect' ready to transmit data.
Reference	+++, AT+SETESC

11 AT+BTCANCEL↵

Response	↯OK↯
Purpose	Terminate a current executing task
Description	This terminates a current executing task, such as Inquiry scan and Page scan, then converts the operation status to 'Standby'.
Reference	AT+BTSCAN, ATD, AT+BTINQ?

12 AT+BTSCAN↵

Response	↯OK↯ ↯CONNECT 112233445566↯
Purpose	Wait for inquiry and connection from other Bluetooth devices
Description	This allows the inquiry and connection from the other Bluetooth devices. The operation status will be in 'Pending' after this command. When connection is made and released, the operation status is back to 'Pending'. To convert the operation status to 'Standby' AT+BTCANCEL must be used. This has the same effect as AT+BTSCAN,3,0. When connection is made with other Bluetooth device, SD response will be 'CONNECT' with its BD address.

Reference	ATD, AT+BTINQ?, AT+BTCANCEL

13 AT+BTSCAN,*n*,*to*↵

Response	↯OK↯ ↯CONNECT 112233445566↯ or ↯OK↯ ↯ERROR↯
Purpose	Wait for inquiry and connection from other Bluetooth devices for a given duration
Parameters	*n*=1: Allows Inquiry scan *n*=2: Allows Page scan *n*=3: Allows both of Inquiry scan and Page scan *to*= Time duration in seconds
Description	For the given *to*, Promi-SD is waiting for the inquiry and connection from other Bluetooth devices. If the parameter of *to* is 0, it will wait forever. When connection is made with other Bluetooth device, SD response will be 'CONNECT' with its BD address. If there is no connection made within this time duration, SD response is 'ERROR' and the operation status becomes to 'Standby'.
Reference	ATD, AT+BTINQ?, AT+BTCANCEL
Example	AT+BTSCAN,2,30

14 AT+BTSCAN112233445566,*to*↵

Response	↯OK↯ ↯CONNECT 112233445566↯ or ↯OK↯ ↯ERROR↯
Purpose	Wait for connection by the Bluetooth device with given BD address
Parameters	112233445566=BD address *to*= time duration in seconds
Description	For the given *to*, Promi-SD is waiting for the connection

	from the Bluetooth device with the given BD address. If the parameter of *to* is 0, it will wait forever. When connection is made with the Bluetooth device, SD response will be 'CONNECT' with its BD address. If there is no connection made within this time duration, SD response is 'ERROR' and the operation status becomes to 'Standby'.
Reference	ATD, AT+BTINQ?, AT+BTCANCEL
Example	AT+BTSCAN000B530011FF,30

15 ATD↵

Response	↯OK↯ ↯CONNECT 112233445566↯ or ↯OK↯ ↯ERROR↯
Purpose	Connect to the last connected Bluetooth device
Description	Promi-SD saves the BD address of the Bluetooth device most recently connected. ATD can make connection to it without input its BD address. If it fails to make connection, SD response is 'ERROR'.
Reference	AT+BTINQ?, AT+BTSCAN

16 ATD112233445566↵

Response	↯OK↯ ↯CONNECT 112233445566↯ or ↯OK↯ ↯ERROR↯
Purpose	Connect to the Bluetooth device with given BD address
Parameters	112233445566=BD address
Description	Promi-SD attempts to connect to the Bluetooth device with the given BD address. To make successful connection, the Bluetooth device must be in Page scan. This attempt continues for 5 minutes. If it fails to make connection, SD response is 'ERROR'.

Reference	AT+BTINQ?, AT+BTSCAN
Example	ATD000B530011FF

17 ATH↵

Response	↯OK↯ ↯DISCONNECT↯
Purpose	Release the current connection
Description	The current Bluetooth connection is released normally. It takes about 30 seconds to detect an abnormal disconnection such as power off and moving out of service range.
Reference	ATD, AT+BTSCAN

18 AT+BTKEY=*$string*↵

Response	↯OK↯
Purpose	Change pin code
Parameters	*$string*= New pin code (Default="1234")
Description	Pin code is a string, which allows 16 alpha-numeric characters maximum. Based on this pin code, Promi-SD generates a link key which is used in actual authentication process.
Reference	AT+BTCSD, AT+BTFP, AT+BTSD?, AT+BTSEC, ATZ, AT&F
Example	AT+BTKEY="apple"

19 AT+BTSD? ↵

Response	↯1122334455 66↯ ↯OK↯
Purpose	Display the list of Bluetooth devices sharing the pin code
Description	Once a connection is made with pin code, Promi-SD saves the Bluetooth device with its link key generated by pin code. The connection to a device listed in Promi-SD can be made automatically without authentication process. The maximum number of the list is 5.
Reference	AT+BTCSD, AT+BTFP, AT+BTKEY, AT+BTSEC, ATZ,

	AT&F

20 AT+BTCSD↵

Response	↯OK↯
Purpose	Clear the list of Bluetooth devices sharing the pin code
Description	This clears the list of Bluetooth devices with link key in flash memory. To take effect of this command, ATZ or power off and on because the main memory still has the list.
Reference	AT+BTFP, AT+BTKEY, AT+BTSD?, AT+BTSEC, ATZ, AT&F

21 AT+BTFP,*n*↵

Response	↯OK↯
Purpose	Set generation of link key every time of connection
Parameters	*n*=0: Inactivate (Default) *n*=1: Activate
Description	If *n* is set to 1, Promi-SD asks pin code every time of connection. This is used to level up the security.
Reference	AT+BTCSD, AT+BTKEY, AT+BTSD?, AT+BTSEC, ATD, ATZ, AT&F

22 AT+BTSEC,*Authentication,Encryption*↵

Response	↯OK↯
Purpose	Set authentication and data encryption
Parameters	*Authentication*=0: Inactivate (Default) *Authentication*=1: Activate *Encryption*=0: Inactivate (Default) *Encryption*=1: Activate
Description	If the authentication is activated, the pin code must be set by AT+BTKEY command. Data encryption cannot be used when authentication is not activated, i.e. *Authentication*=0 and *Encryption*=1 is not valid.
Reference	AT+BTCSD, AT+BTFP, AT+BTSD?, AT+BTSD?, ATZ, AT&F

23 AT+BTNAME=*$string*↵

Response	↯OK↯
Purpose	Change device name
Parameters	*$string*= New device name (Default="PSDv3b-445566")
Description	Promi-SD can have a user friendly name to identify easily. The name allows 30 alpha-numeric characters maximum.
Reference	AT+BTINFO?, AT+BTINQ?
Example	AT+BTNAME="My-Promi-SD"

24 AT+BTLPM,*n*↵

Response	↯OK↯
Purpose	Set low power mode
Parameters	*n*=0: Inactivate (Default) *n*=1: Activate
Description	During no data transmission, Promi-SD can be in low power mode to save the power consumption. It takes a few seconds to wake up Promi-SD in low power mode.

25 AT&V↵

Response	↯S0:m0;S1:m1; …Sn:mn↯ ↯OK↯
Purpose	Display all the S-register
Description	All parameters are stored at S-register in flash memory. These values are sustained until hardware reset.
Reference	ATS

26 ATS*nn*? ↵

Response	↯value↯ ↯OK↯
Purpose	Display a given S-register
Parameters	*nn*= Address of S-register
Description	A specific S-register is displayed.

Reference	AT&V

27 ATS*nn*=*mm*↵

Response	↯OK↯
Purpose	Change S-register value
Parameters	nn= Address of S-register mm= New value of S-register
Description	Some S-registers are optimized for the overall performance and protected from an arbitrary change by user. When users try to change these S-registers, SD response is 'ERROR'. For details of S-register, refer Appendix. B.
Reference	AT&V
Example	ATS10=0

Command Validity

AT Command	Standby	Pending	Connect
AT	○	○	
ATZ	○	○	
AT&F	○	○	
AT+BTINQ?	◎		
ATD112233445566	◎		
ATD	◎		
AT+BTSCAN	◎		
AT+BTSCAN,n,to	◎		
AT+BTSCAN112233445566,to	◎		
AT+BTCANCEL		○	
+++			○
AT+SETESC	◎		
ATO	●		
ATH	●		

AT+BTSEC,Auth,Encr	◎	
AT+BTLAST?	○	○
AT+BTMODE,n	◎	
AT+BTNAME="Name"	◎	
AT+BTKEY="nnnn"	◎	
AT+BTINFO?	○	○
AT+BTLPM,n	◎	
AT+BTSD?	○	○
AT+BTCSD	◎	
AT+BTFP,n	◎	
AT+UARTCONFIG,b,p,s	◎	
AT+USEDIP?	○	○

◎ Valid only when Promi-SD is not connected to other Bluetooth device.

● Valid only when Promi-SD is connected to other Bluetooth device.

Appendix. B S-Register

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S-Register

S-registers contain 46 parameters of Promi-ESD. These are stored in flash memory and sustained the values unless hardware reset is executed. The value of S-register can be accessed and changed with ATS command by user. Some S-registers not shown below are set to maximize the performance of Promi-ESD. Thus it is not recommended to change these S-registers.

Change the value of S-register only in Standby status.

↘ S1: Force to Reconnect (default 1)

S1=0, Promi-ESD in Mode1 does not try reconnection when disconnected.

S1=1, Promi-ESD in Mode1 keeps trying reconnection when disconnected.

↘ S3: Stream UART Policy (default 0)

S3=0, the priority of UART streaming is throughput.

S3=1, the priority is latency, which minimizes the delay of data transmission. This is useful in case of transmiting very small data quickly.

↘ S4: Enable Remote Name Query (default 1)

S4=0, Promi-ESD inquires only BD address. This speeds up the inquiry process.

S4=1, Promi-ESD inquire BD address, device name and class of device.

↘ S10: Enable SD Response (default 1)

S10=0, Promi-ESD does not send SD responses to host system.

S10=1, Promi-ESD send SD responses to host system.

↘ S11: Enable Escape (default 1)

S11=0, Promi-ESD does not allow escape sequence character. The operation status of Connect cannot be changed to Standby. As Promi-ESD skips the process detecting escape sequence character, the more efficient data transmission is expected.

S11=1, Promi-ESD allow escape sequence character. Whenever it is needed, the Connect status can be changed to Standby.

↘ S12: Clear Data Buffer When Disconnected (default 0)

S12=0, Promi-ESD does not clear the data buffer received from host system when disconnected.

S12=1, Promi-ESD clears the data buffer when disconnected.

↘ S14: Enable DTR Transfer (default 1, ESD01 only)

S14=0, DTR/DSR signal is transferred to loop-back.

S14=1, DTR signal is transferred to DSR of remote device.

↘ S15: Enable Disconnect by DTR (default 0, ESD01 only)

S15=0, DTR signal cannot release the connection.

S15=1, The connection can be released when DTR signal is off.

↘ S24: Maximum Number of Inquiry Result (default 10)

The maximum number of inquiry list can be controlled.

↘ S28: Escape Sequence Character (default 43)

The decimal number of the ASCII code of escape sequence character can be controlled. The initial value is 43, the ASCII code of '+'.

↘ S29: Error Code

The most recent error code is stored in this register. User cannot change this value.

↘ S31: Page Timeout (default 300)

This is the timeout in seconds to attempt connection with ATD command.

↘ S33: Inquiry Timeout (default 30)

This is the timeout in seconds to execute inquiry scan.

↘ S37: Supervision Timeout (default 16000)

This is the timeout in 625μsec to presume disconnection, which is set to 16000 initially. 16000×625μsec=10sec)

The smaller the value becomes, the more quickly Promi-ESD can detect an abnormal disconnection. But when the communication is suspended for some environmental reasons, it may be regarded as disconnection.

↘ S46: BD Address of Last Connected Device

This saves the BD address of the Bluetooth device connected most recently.

Appendix. C How to make a RS232 interface Jig Board

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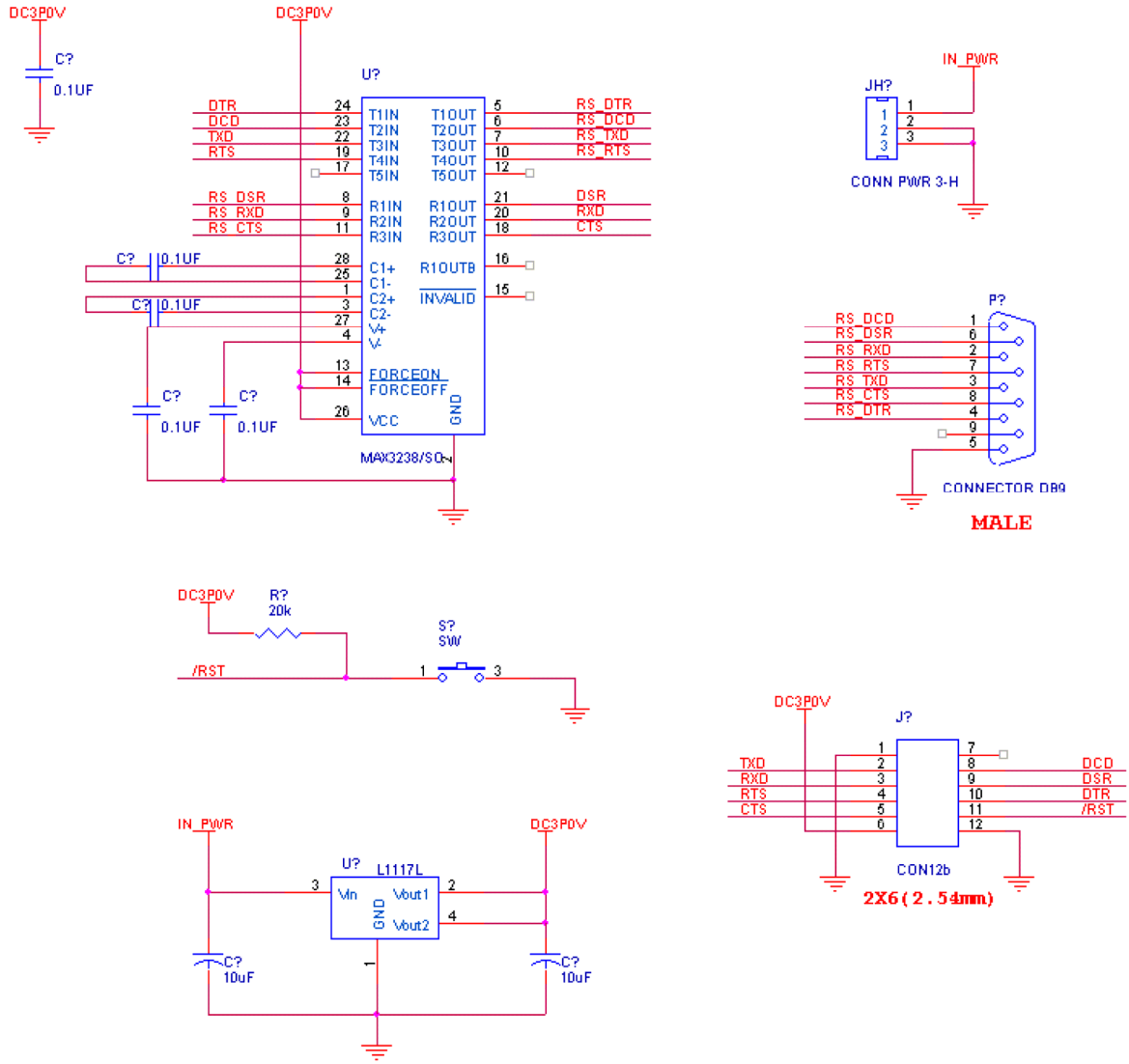
How to make a RS232 interfaced Jig Board



Appendix D. Technical Support

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Use this form to request technical support for Promi-ESD. Individual form should be filled out for each Promi-ESD in question. Referring to the example on separate sheet, please provide as much information as possible so we may resolve and respond to your inquiry promptly. When you have finished, submit this form by e-mail to support@initium.co.kr or by fax to +82 31 782-3230.

NOTE: Before you contact technical support, please have a look at our FAQ. Chances are, you will find an instant answer to your problem.

✓ indicates a required field.

↘ **User Contact Information**

Name ✓	
Company	
E-mail ✓	
Phone ✓	
Fax ✓	

↘ **Overall Hardware Setup** ✓

(Depict or describe actual hardware connections)

↘ **Host Device** ***(to which Promi-ESD is attached)***

Description ✓				
Serial Port Setup	*Port*		*Parity* ✓	
	Baud Rate ✓		*Stop Bits* ✓	
	Data Bits ✓		*Flow Control* ✓	
Comments				

↘ **Promi-ESD**

Model Name ✓		BD Address* ✓	
S-Register** ✓			

* BD Address is the 6-digit number labeled on the product.

** As for S-Register, the values are shown by "AT&V" command on a PC running Serial Port program (e.g. HyperTerminal). See the User's Manual for details.

↘ **Pin Assignment to Promi-ESD**

Promi-ESD				Host Device		
Direction	Signal	Pin #		Pin #	Signal	Direction
Out	CD	1	↔			
Out	TxD	2	↔			
In	RxD	3	↔			
In	DSR	4	↔			
–	GND	5	↔			
Out	DTR	6	↔			
In	CTS	7	↔			
Out	RTS	8	↔			
In	Vcc	9	↔			

↘ **Bluetooth Connection: This Promi-ESD is connected to (*mark one*)**

☐ an another Promi-SD		
☐ a Promi-ESD		
☐ a Promi-MSP		
☐ others	Model ✓	
	Manufacture	
	Application S/W	

↘ **Environment for RF Communication**

Distance* ✓	
Obstacles** ✓	

↘ **Problems you have**

* Distance is a linear distance between Promi-ESD and the other side Bluetooth device.
** Obstacles are things affecting RF performance in the middle of Promi-ESD and the other side Bluetooth device, such as walls, partitions, other equipments, etc.

Appendix E. Regulatory Information

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FCC Compliance

↘ FCC Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

↘ Caution

Any changes or modifications NOT explicitly APPROVED by Initium Co., Ltd. could cause the Promi-ESD module to cease to comply with FCC rules part 15, and thus void the user's authority to operate the equipment.

↘ RF-exposure statement

These modular transmitters, Promi-ESD, comply with FCC radiation exposure limits set forth for an uncontrolled environment. The Promi-ESD should be installed and operated with minimum distance 20cm between the antenna and the body of the user or nearby persons.

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the users manual of the end product which integrate this module.

This device is intended only for OEM integrators under the following conditions:

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as the 2 conditions above are met, further transmitter testing will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

IMPORTANT NOTE: In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

↘ Antenna

These modular transmitters are for OEM integrations only. The end-user product will be installed in such a manner that only the authorized antennas are used.

↘ Label and manual requirements for the End Product

For an end product using the Promi-ESD there must be a label containing, at least, the following information:

FCC ID for model Promi-ESD01

This device contains FCC ID: QOCPRMI-ESD01

FCC ID for model Promi-ESD02

This device contains FCC ID: QOCPRMI-ESD02

The label must be affixed on an exterior surface of the end product such that it will be visible upon inspection in compliance with the modular approval guidelines developed by the FCC.

Where the Promi-ESD will be installed in final products larger than 8cm x 10cm following statements has to be placed ONTO the device.

"This device complies with Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation."

In case where the final product will be installed in locations where the end-consumer is not able to see the FCC ID and/or this statement, the FCC ID and the statement shall also be included in the end-product manual.

The users manual for end users must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter."

EU Compliance

↘ Regulatory compliance of the Promi-ESD

The Promi-ESD are made for OEM integrations only. The European regulations applying to the Promi-ESD is the R&TTE Directive 1999/5/EC.

Promi-ESD meets the following requirements of the R&TTE Directive.

R&TTE Directive article	Test category	Harmonized standard
Article 3.1(a)	Protection of health and safety	EN 60950, EN 50385
Article 3.1(b)	EMC	EN 301 489-1/-17
Article 3.2	Effective use of the spectrum	EN 300 328

The conformity assessment for the Promi-ESD were completed in accordance with the R&TTE Directive Annex IV procedures, and the EC Declaration of Conformity is attached to this manual.

↘ Cautions regarding regulatory compliance when integrating the Promi-ESD

The person integrating the Promi-ESD becomes the manufacturer of the final product and is therefore responsible for demonstrating compliance of the product with the essential requirements of the R&TTE Directive.

In all cases assessment of the final product must be made against the Essential requirements of the R&TTE Directive Article 3.1(a) and (b), safety and EMC respectively, and any relevant Article 3.3 requirements

This device is intended only for OEM integrators under the following conditions:

1. This appliance and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

2. A minimum separation distance of 20 cm must be maintained between the antenna and the person for this appliance to satisfy the RF exposure requirements of the Council recommendation 1999/519/EC of 12 July 1999.

As long as the 2 conditions above are met, no further evaluation under Article 3.2 of the R&TTE Directive and do not require further involvement of an R&TTE Directive Notified Body for the final product. In all other cases, or if the manufacturer of the final product is in doubt then the equipment integrating the radio module must be assessed against Article 3.2 of the R&TTE Directive.

Please note that this product, Promi-ESD01, uses radio frequency bands not harmonized throughout the Community. This product is classified as Class 2 radio equipment for which some Member States apply restrictions on placing on the market and in use. Any parties putting Class 2 radio equipment on the market must notify the relevant national spectrum management authority of their intention, and the radio equipment must be given a Class Identifier (alert symbol).

↘ Antenna

This product, Promi-ESD, is for OEM integrations only. The end-user product will be installed in such a manner that only the authorized antennas are used.

↘ Enclosure

This product, Promi-ESD, is made for integrating in another final product. For this reason, there are some parts of the final product on which the Promi-ESD depends for regulatory compliance regarding EMC and safety. The Promi-ESD is mounted on the circuit board of the final product, and must be contained inside the case of the final product. Integrated the Promi-ESD in the final product so that its surfaces are not in contact with the outside.

↘ Documentation

In the documentation for the conformity assessment of the final product, state clearly that the Promi-ESD is integrated in the system.

↘ Conformity Assessment of the Products integrating the Promi-ESD

The following is a supplementary explanation of conformity assessments for final products integrating the radio modules such as the Promi-ESD, that have passed conformity assessments in accordance with the R&TTE Directive.

The procedures for conformity assessment in accordance with the R&TTE Directive are the responsibility of the manufacturer of the final product. With final products integrating radio modules, the person who integrates the module in the system becomes the manufacturer of the final product, and it is their responsibility to certify that the requirements of the R&TTE Directive and met.

↘ Exemption from conformity assessment

However, if radio modules that meet the requirements of the R&TTE Directive and that have passed the conformity assessment are integrated in a final product that follows the cautions concerning integrating radio modules, they are exempted from the conformity assessment for R&TTE Directive Article 3.2 (efficient use of the radio spectrum). For details, refer to the following Guidance and ETSI Technical Report from the R&TTE Compliance Association, and check whether your case applies.

Organization	R&TTE Compliance Association	Document No. TGN 01 Rev 3
Document title	Technical Guidance Note on Requirement for a Final Product that Integrates an R&TTE Directive Assessed Module	
URL	You can download the guidance from the download area of R&TTE Compliance association. http://www.rtteca.com	

Organization	ETSI (Technical report)	Document No. ETSI TR 102 070-2
Document title	Electromagnetic compatibility and Radio spectrum Matters (ERM); Guide to the application of harmonized standards to multi-radio and combined radio and non-radio equipment; Part 2: Effective use of radio frequency spectrum	
URL	You can download the guidance from the ETSI web site by entering TR102 070-2 in the search engine. Before downloading, you will be requested to register. http://www.rtteca.com	

↘ Conformity assessment procedures for final products exempted from R&TTE Directive Article 3.2

In every case, the manufacturer of a final product must follow the procedures for conformity assessment of the final product with the requirements of R&TTE Directive Article 3.1(a) and (b), for safety and EMC. The conformity assessment for Article 3.2 is carried out in accordance with the following:

1) Attach the EN 300 328 test report of the assessed radio module and the EC Declaration of Conformity to the conformity assessment of the final product (The Declaration of Conformity is attached to the manual).

2) Specify on the conformity assessment of the end product that the assessed radio module was integrated in the system without any changes, in accordance with the installation directions of the manufacturer.

↘ Notification of the final product

Please note that this product, Promi-ESD01, uses radio frequency bands not harmonized throughout the Community. The notification required by R&TTE Directive Article 6(4) is necessary. It is the responsibility of the manufacturer of the final product to notify the relevant national spectrum management authority of the intention to place the final product on the market.

↘ CE marking

It is necessary to attach the CE mark to the final product to indicate that it conforms with all the directives that apply to the final product. For model Promi-ESD01, it must be given a Class Identifier (alert symbol) in addition to the CE mark.

↘ Exemption clause

Initium Co., Ltd. does not guarantee the accuracy of the information above. In case of doubt or uncertainty, we recommend that you check with the authorities or official certification organizations of the relevant countries.

Declaration of Conformity

Manufacturer Initium Co., Ltd.

Address # 901, Kins Tower, 25-1 Jungjadong, Bundanggu,
Sungnam City, Kyunggi, 463-811 South Korea

Declares that the following product

Product Name: Bluetooth Serial Adapter
Model Number: Promi-ESD01

conforms to the technical regulations applicable to the product within the scope of the Low Voltage Directive 73/23/EEC, the EMC Directive 89/336/EEC and the R&TTE Directive 99/5/EC:

LVD EN 60950:2000 (3rd Edition)
EN 50385:2002

EMCD EN 301 489-1 V1.4.1 (2002-08)
EN 301 489-17 V1.2.1 (2002-08)

R&TTED EN 300 328 V1.6.1 (2004-11)

All essential radio test suites have been carried out. The relevant technical file is available for inspection.

Notified Body EMCCert Dr.Rasek

Address Boelwiese 5
91320 Ebermannstadt, Germany
Notified Body Number: 0678

This declaration is issued under the sole responsibility of the manufacture and, if applicable, his authorized representative.

Point of contact Je-Kook Ryu, TEL: +82-31-782-3234, FAX: +82-31-782-3230

South Korea, October 17, 2005

Je-Kook Ryu / Managing Director