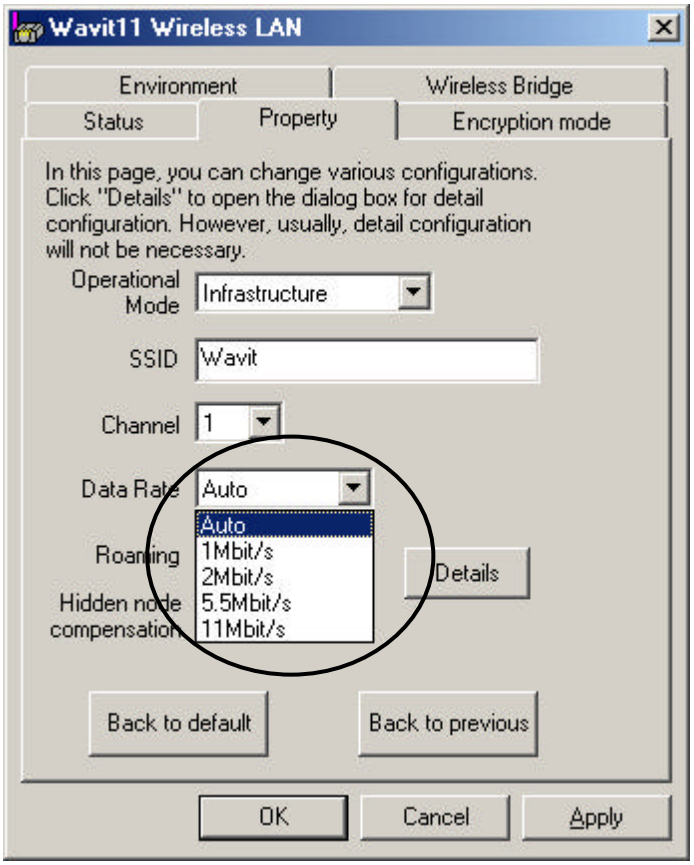
10.4. Data Rate

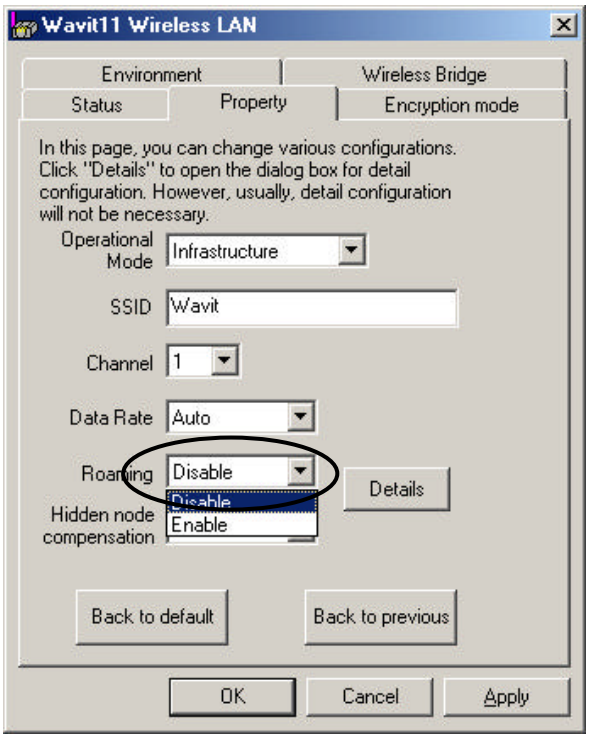
There are 5 choices: 1Mbps, 2Mbps, 5.5Mbps, 11Mbps and the automatic setting.



When the automatic setting is selected, Wavit11 makes communication in the fastest possible rate, and this depends on the equipment at the other end. If the communication environment is degraded and making communication in the present data rate becomes impractical, the data rate will be lowered and the wireless LAN communication will continue.

10.5. Roaming

This is a way to set whether the Wavit11does a roaming or not.



What is Roaming?

This function can be activated in an environment where multiple Access Points exist. If the wireless LAN under communication with a certain Access Point moves and fails in receiving the radio wave, the roaming function will enable Wavit11 to change the destination to the other nearby Access Point. If Wavit11 switches the Access Point successfully, it can send and receive the wireless LAN data without interruption, and that it can access the network without any interruption.

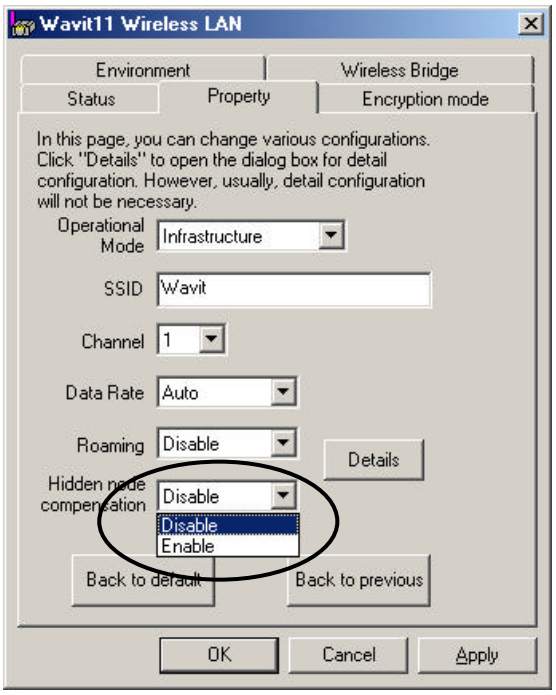
Setting up of Roaming function will be possible only if the operational mode is as follows:

Infrastructure mode

AP mode

10.6. Hidden Node Compensation

Depended on the placement of multiple wireless LANs, there is a case that the wireless LAN communication disturbance caused by other wireless LANs takes place and the data rate may be fallen off. If the Hidden Node Compensation is set to Enable, the Wavit11 seizes the wireless LAN communication line prior to the actual data transmission, so it can mitigate the mutual disturbance of wireless LAN communication and the degradation of data rate.



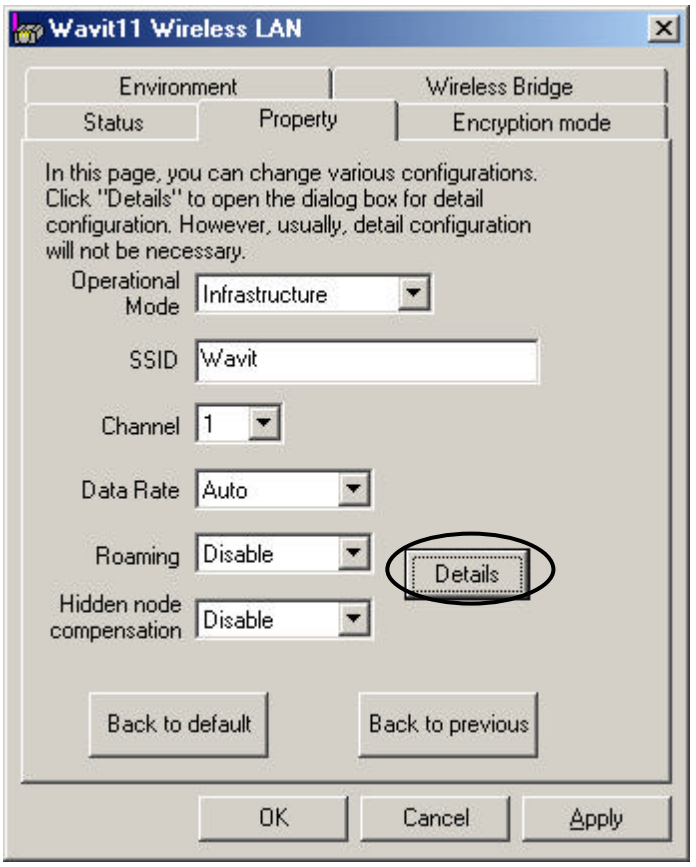
What is Hidden Node?

In the wireless LAN system, many wireless LANs communicate each other on the same frequency. Normally every wireless LAN senses whether or not another wireless LAN has already started the wireless LAN communication so as not to disturb the already started wireless LAN communication.

However, some wireless LANs disturb the already started wireless LAN communication transmitting the data without sensing the existence of another wireless LAN communication. Such a kind of wireless LAN that may disturb the other wireless LAN communication is called Hidden Node.

10.7. Details

Click the “Details” button to enable the Wavit11 detailed setting.

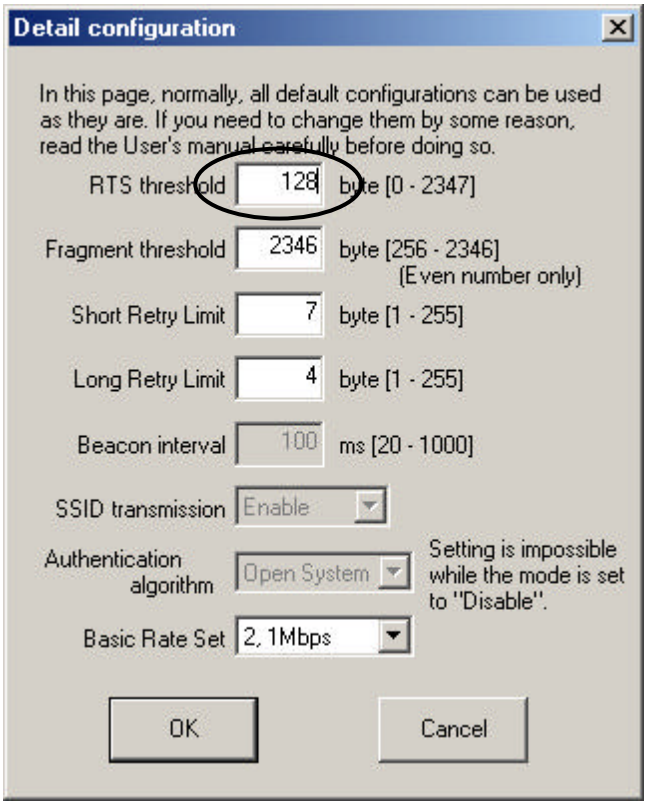


Normally you do not need to change these items.
Check each item of this manual, when the setting should be modified.

10.8. RTS Threshold

In the case that the Hidden node compensation is set to Enable, setup of RTS threshold will be possible.

The Wavit11 seizes the wireless LAN communication line prior to actual data transmission if the data length is greater than RTS Threshold. When the Hidden node compensation is set to Enable, the initial value is 0, therefore, the Wavit11 seizes the wireless LAN communication line prior to every length of actual data transmission.

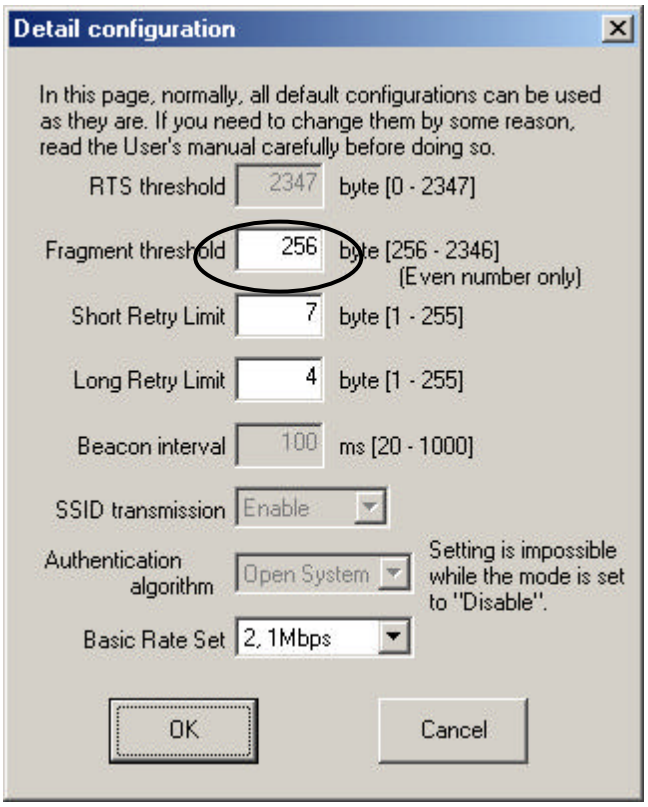


The wireless LAN performance will improve when this RTS Threshold is enlarged, in the case that Hidden node disturbance is not so violent. Check the performance by modifying the RTS threshold, when you modify the value from the initial value, because the optimal RTS threshold depends on the placement and application of wireless LAN.

10.9. Fragmentation Threshold

In the case that the transmitted data do not correctly reach the wireless LAN on the partner side, the Wavit11 will retransmit the data predefined times. This retransmission occurs frequently by a communication error under poor communication condition and the performance of the wireless LAN network sometimes deteriorates.

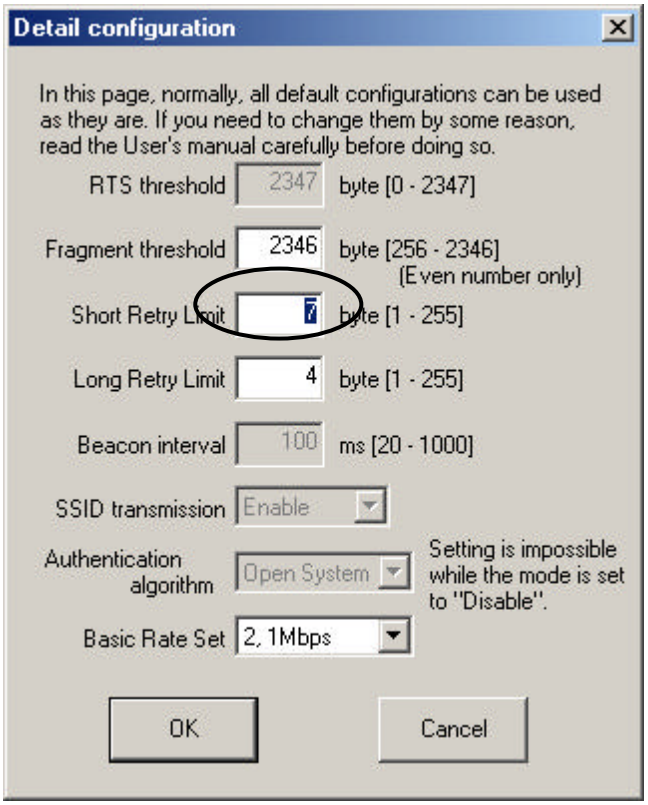
There is a way to mitigate the performance deterioration, that is the retransmission of divided frame. Thus, the wireless LAN frame should be divided into small pieces, and here is a way to set the size of divided frame.



All frames are sent without any data frame division in default setting.

10.10. Short Retry Limit

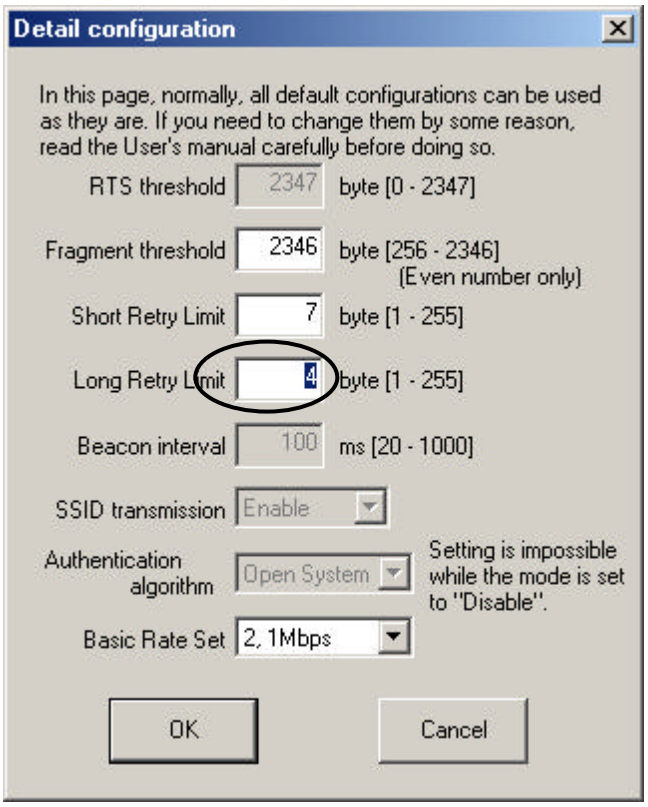
In the case that the transmitted data do not correctly reach the wireless LAN on the partner side, the Wavit11 will retransmit the data predefined times and the number of retransmission times is set here. In Short Retry Limit, the number of retransmission is set, for the data frame whose length is below RTS threshold.



If a big value is set needlessly, the Wavit11 may try to retransmit data many times to the wireless LAN at which the radio wave cannot get, so the performance of the whole wireless LAN can be deteriorated. Closely examine the degree of performance required by the application, if you modify the setting.

10.11. Long Retry Limit

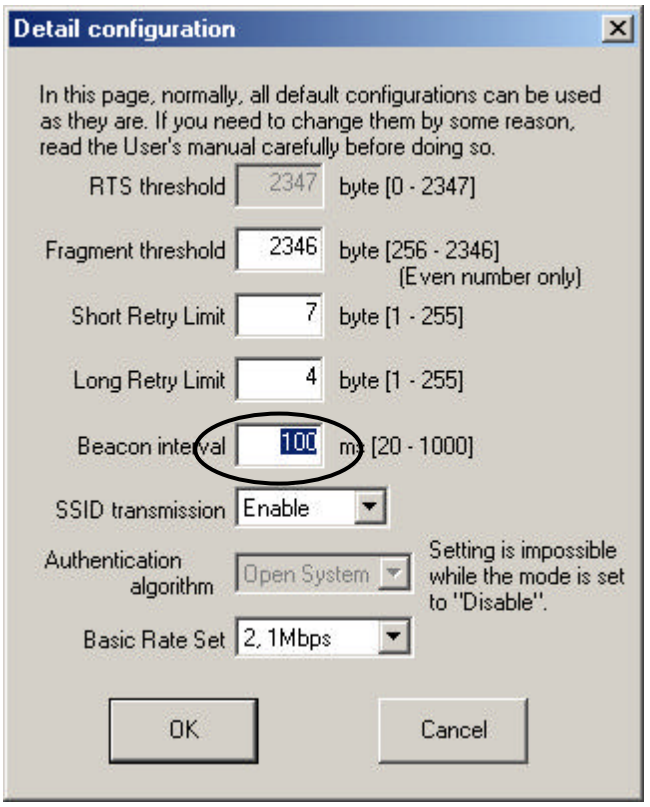
In the case that the transmitted data do not correctly reach the wireless LAN on the partner side, the Wavit11 will retransmit the data predefined times and the number of retransmission times is set here. In Long Retry Limit, the number of retransmission is set, for the data frame whose length is above RTS threshold.



If a big value is set needlessly, the Wavit11 may try to retransmit data many times to the wireless LAN at which the radio wave cannot get, so the performance of the whole wireless LAN can be deteriorated. Closely examine the degree of performance required by the application, if you modify the setting.

10.12. Beacon Interval

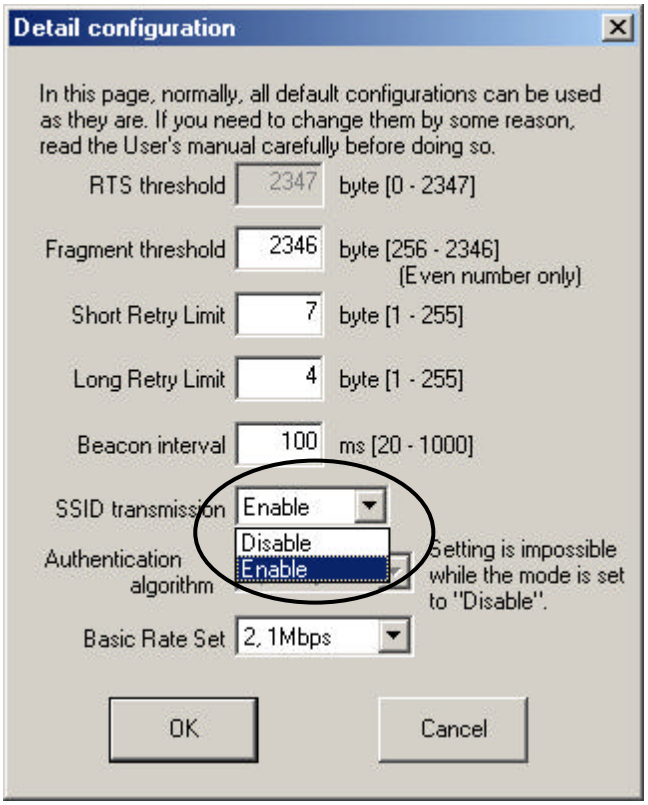
The Wavit11 in AP mode periodically transmits special frame called Beacon to information about current setting to another Wavit11 that tries to join the wireless LAN network. Here, is a way to set the Beacon interval.



This item can be set only if the operational mode is AP mode.

10.13. SSID transmission

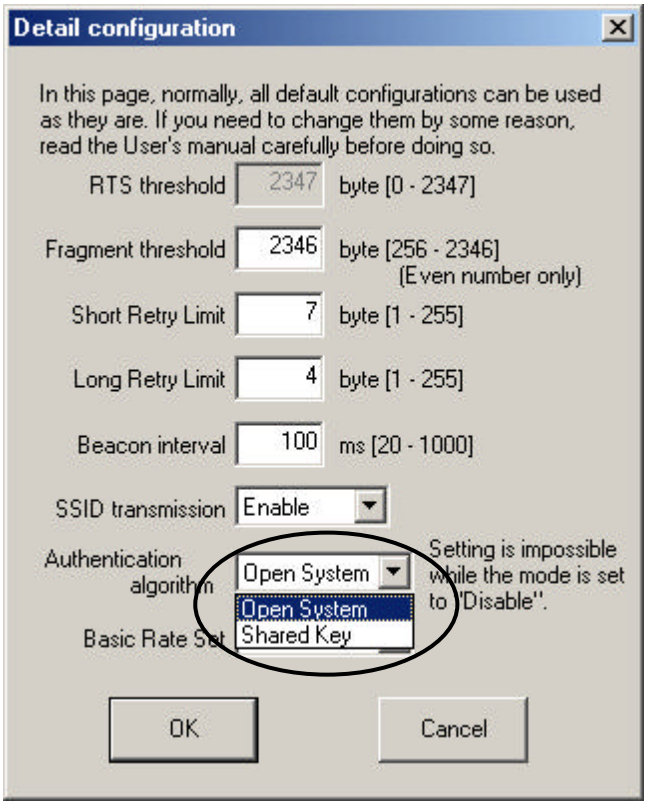
This is a description to set SSID transmission. It is possible to select whether SS ID should be included in Beacon frame transmitted by Wavit11 in AP mode.



This item can be set only if the operational mode is AP mode.

10.14. Authentication Algorithm

The algorithm that is used for the Authentication between Wavit11 is selected. There are 2 kinds of Authentication Algorithm, Open System and Shared Key, and the checking of the encryption key is carried out mutually in Shared Key.



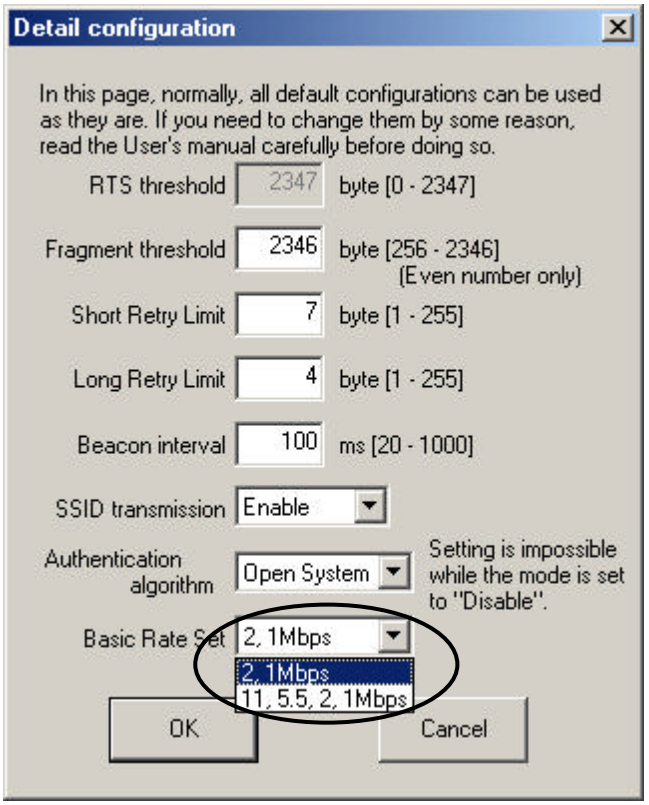
You can set this item in the following operational mode.

- Infrastructure mode
- AP mode
- Both mode
- **802.11 Ad-Hoc mode**

You cannot set this item if the encryption mode is set to Disable.

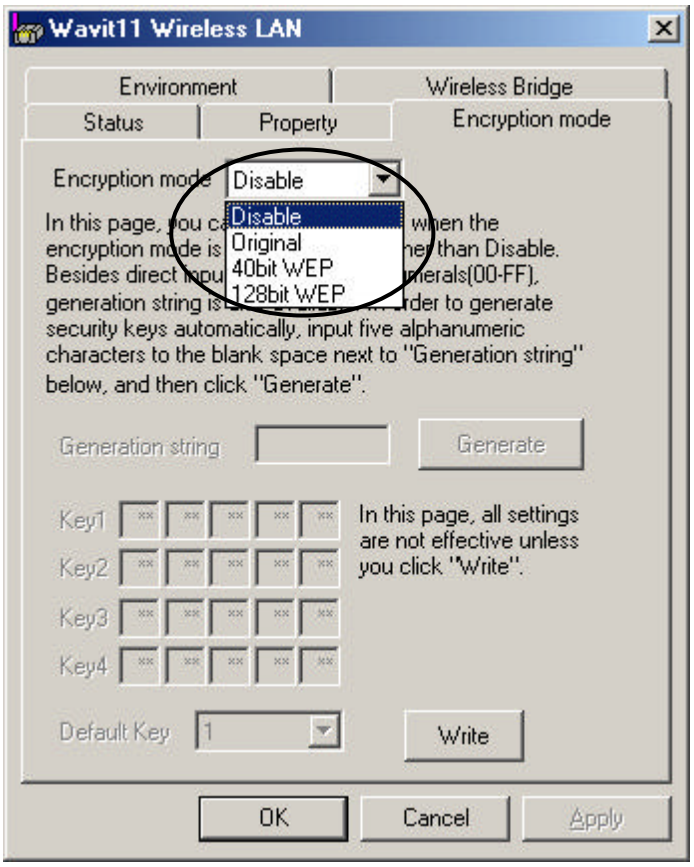
10.15. Basic Rate Set

The sending speed of broadcast and multicast frame can be set.



10.16. Encryption mode

The Encryption mode used for the wireless LAN communication between Wavit11 is selected.



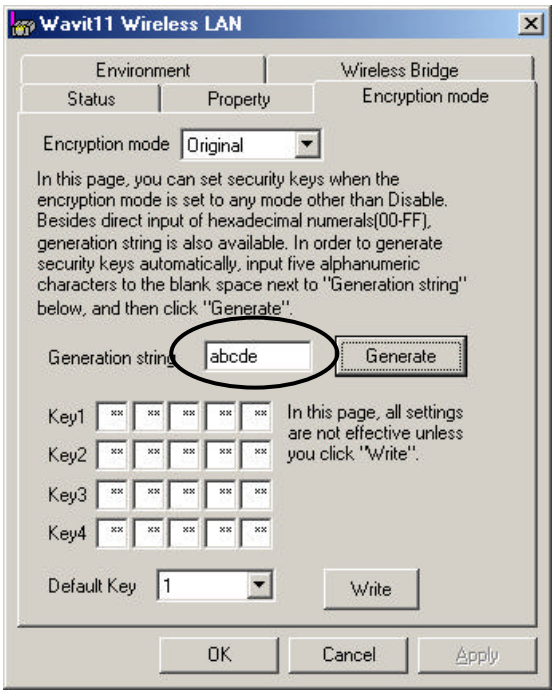
It is not possible to make communication between Wavit11 with different encryption mode.

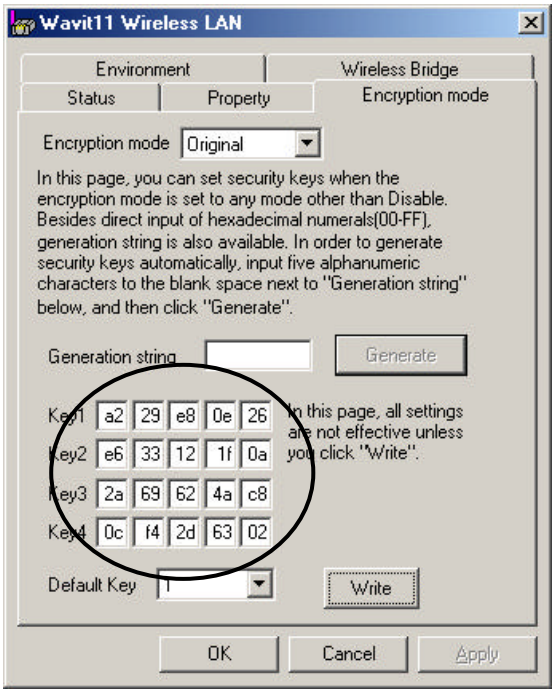
10.17. Encryption Key

It is the Encryption key for the encryption of data transmission. Set the same encryption key to each Wavit11.

There are two ways to set encryption key:

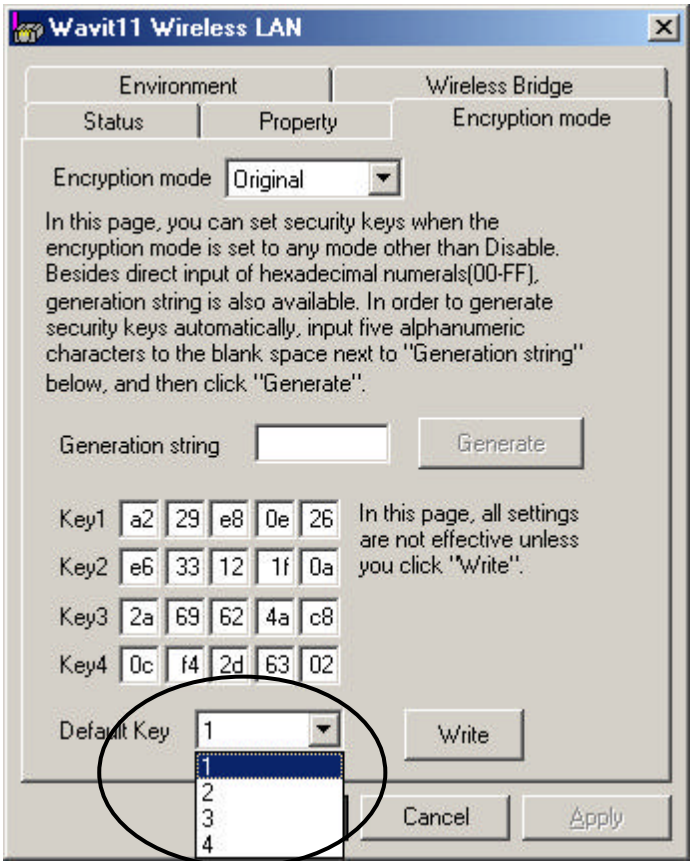
- You set some string and the Wavit11 automatically generate encryption key from string.
- You set the encryption key directly.





10.18. Default Key

This is one of the encryption keys Wavit11 use for data transmission.

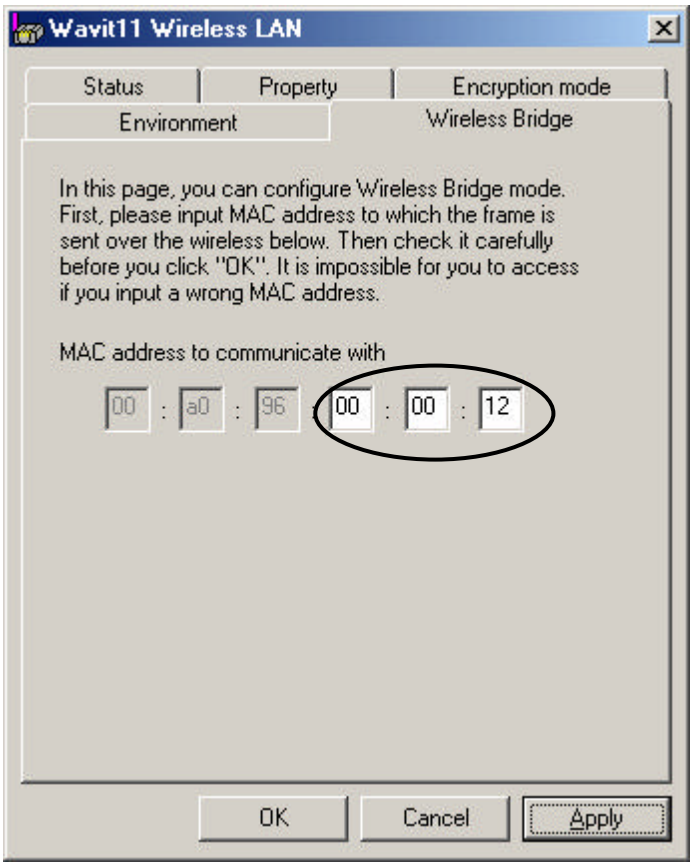


You can set this item if the Encryption Mode is either “Original” or “40bit WEP”.

When the different Default Key is set to each Wavit11, the security against the illegal wiretapping is strengthened.

10.19. Destination Address

Set the MAC address of the Wavit11 on the other side for Wireless Bridge operation. The MAC address is indicated at the label put at the back of the Wavit11.



Make sure to satisfy the following condition to set the MAC address correctly for the successful Wireless Bridge operation:

- Wavit11 should be in Wireless Bridge mode
- Channel should be the same

11. Interoperability with third vendor wireless LAN

Wavit11 has interoperability with third vendor wireless LAN under certain conditions. If you install intermixed wireless network of third vendor Wireless LAN and Wavit11, refer to User's Manual enclosed in the package of third vendor wireless LAN. However, Mitsumi does not guarantee that Wavit11 can communicate with non-Wavit11 wireless LAN.

11.1. Confirmed wireless LAN card

Table 1.1 Wireless LAN Card information

Vendor	Product	Model#	Firmware Version	Driver Version
3Com	3ComAirConnect Wireless LAN PC Card	3CRWE737A	V2.20-01	2.2.5.10
Apple	AirMac Card	M7600J/B	1.3.1	
Cisco	Cisco Aironet 340 Series Wireless PC Card	AIR-PCM-342	4.23	6.64
COMPAQ	WL-100 Wireless LAN PC Card	WL-100	00.08.00.00	0.29.4
Corega	corega Wireless LAN PCC11	CG-WLPCC11		0.29.4
Corega	corega Wireless LAN PCCA11	CG-WLPCCA11		0.29.4
Elecom	Laneed Wireless PC Card	LD-W11/PCC	0.7.5	1.0.4
Linksys	Instant Wireless Network PC Card	WPC11	00.08.00.00	0.29.10a
Lucent	ORINOCO PC Card Gold	PC24E-H-FC	4.04/6.16	6.28
Melco	AirStation Wireless LAN Card	WLI-PCM-L11		1.21
Melco	AirStation Wireless LAN Card	WLI-PCM-L11G		1.21
Melco	AirStation Wireless LAN Card	WLI-PCM-S11		1.01.00.0
NEC	WarpStar Aterm WL11C	PC-WL/11C		1.0.0.0
NTT-ME	MN128 SS-LAN CARD11	WLC010-D53	00.07.05.00	0.29.4
Samsung	SWL-2000N 11Mbps Wireless LAN PC Card	SWL-2000N	0.75	3.65
Symbol	Spectrum24 PC Card 11Mbps	LA4121-1020	V2.20.01	2.2.5.10

Table 1.2 Test results

Vendor	Model #	Results								
		AdHoc			802.11AdHoc(IBSS)			Infrastructure		
		WEP Disable	WEP 40bit	WEP 128bit	WEP Disable	WEP 40bit	WEP 128bit	WEP Disable	WEP 40bit	WEP 128bit
3Com	3CRWE737A	OK	OK	OK	OK	OK	OK	OK	OK	OK
Apple		-	-	-	OK	-	-	OK	-	-
Cisco	AIR-PCM-342	-	-	-	OK	OK	OK	OK	OK	OK
COMPAQ	WL-100	OK	OK	OK	OK	OK	OK	OK	OK	OK
Corega	CG-WLPCC11	OK	OK	-	-	-	-	OK	OK	-
Corega	CG-WLPCCA11	OK	OK	-	-	-	-	OK	OK	-
Elecom	LD-W11/PCC	OK	OK	-	-	-	-	OK	OK	-
Linksys	WPC11	OK	OK	OK	OK	OK	OK	OK	OK	OK
Lucent	PC24E-H-FC	-	-	-	OK	NG(2)	NG(2)	OK	OK	OK
Melco	WLI-PCM-L11	OK(1)	OK(1)	-	-	-	-	OK(1)	OK(1)	-
Melco	WLI-PCM-L11G	OK	OK	OK	-	-	-	OK	OK	OK
Melco	WLI-PCM-S11	OK	OK	-	-	-	-	OK	OK	-
NEC	PC-WL/11C	NG	NG	-	-	-	-	OK	OK	-
NTT-ME	WLC010-D53	OK	OK	OK	OK	OK	OK	OK	OK	OK

Samsung	SWL-2000N	OK	OK	OK(1)	-	-	-	OK	OK	OK(1)
Symbol	LA4121-1020	OK	OK	OK	OK	OK	OK	OK	OK	OK

(1) This product does not receive fragmented frame.

(2) This product does not support hexagonal encryption key setting.

11.2. Confirmed Access Point

Table 2.1 Wireless LAN Access Point Information

Vendor	Product	Model #	Firmware Version
3Com	3ComAirConnect Wireless LAN Access Point	3CRWE747A	01.50.10
Apple	AirMac Base Station	M7601J/B	
Cisco	Cisco Aironet 340 Series Access Point	AIR-AP342E2C	4.25.08
COMPAQ	WL-400 Wireless LAN Hardware Access Point	WL-400	2.5.3
corega	corega Wireless LAN AP-11	CG-WLAP11	4.5.5G
Elecom	Laneed Airhawk	LD-W11/AP	2.0.0
IO-DATA	Wireless LAN Access Point	WN-B11/AXP	3.0.39
Lucent	ORINOCO WavePOINT2 Access Point	WavePOINT2	3.71
Melco	AirStation Access Point WLA-T1-L11	WLA-T1-L11	v100
Melco	AirStation Access Point WLA-L11	WLA-L11	6.08
Melco	AirStation Access Point WLA-L11G	WLA-L11G	6.08
NEC	WarpStar Aterm WL50T	PC-WL50T1	
NTT-ME	MN128 SOHO SLOT IN AirPack11		1.70
Symbol	Spectrum24 Access Point 11Mbps	AP4121-1050	02.20.04
YAMAHA	Net Volante RT60w	RT60w	5.0010

Table 2.2 Test Results

Vendor	Modem #	Results		
		WEP Disable	WEP 40bit	WEP 128bit
3Com	3CRWE747A	OK	OK	-
Apple		OK	-	-
Cisco	AIR-AP342E2C	OK	OK	OK
COMPAQ	WL-400	OK	OK	OK
corega	CG-WLAP11	OK	OK	OK
Elecom	LD-W11/AP	OK	OK	-
IO-DATA	WN-B11/AXP	OK	OK	-
Lucent		OK	OK	OK
Melco	WLA-T1-L11	OK	-	-
Melco	WLA-L11	OK	OK	-
Melco	WLA-L11G	OK	OK	-
NEC	PC-WL50T1	OK	OK	-
NTT-ME	AirPack11	OK	OK(1)	OK(1)
Symbol	AP4121-1050	OK	OK	-
YAMAHA	RT60w	OK	OK	-

11.3. Setting

The general setup method to connect with third vendor wireless LAN is as follows, for each communication mode.

(Ad-Hoc mode)

In Ad-Hoc mode, set same channel to both Wavitr11 and third vendor Wireless LAN.

(802.11 Ad-Hoc mode)

In 802.11 Ad-Hoc mode, set same SSID to both Wavit11 and third vendor wireless LAN.

(Infrastructure mode)

In Infrastructure mode, set same SSID to both Wavit11 and third vendor Access Point.

(AP mode)

In AP mode, set same SSID to Wavit11 and third vendor Wireless LAN.

(Wireless Bridge mode)

In Wireless Bridge mode connection to the third vendor wireless LAN is not possible. You need to use two Wavit11s when you set up a wireless bridge.

Wavit11 mode	Wavit11 setting	Wireless LAN setting	Access Point setting
Ad-Hoc	Channel	Channel	
802.11Ad-Hoc	SS ID	SS ID	
Infrastructure	SS ID		SS ID (ESS ID)
Both	SS ID Channel	SSID Channel	SS ID (ESS ID) Channel
AP	SS ID	SS ID (ESS ID)	
Wireless Bridge			

12. Troubleshooting

Situations	Verifying	Measures
It does not work	Does Power LED light up?	Connect AC Adapter to Wavit11. Connect AC Adapter to the outlet.
	Does LINK LED light up?	Connect 10BASE-T cable properly. Check 10BASE-T cable polarity.
	Does TX/RX LED light up?	Install Wavit11 near the target Wireless LAN, and confirm the communication.
	Are the configuration settings appropriate to meet the condition of the target Wavit11?	By using configuration tool, check configuration.
It does not communicate in Ad-Hoc mode.	Is the channel settings appropriately?	In Ad-Hoc mode, the same should be set. Open the configuration tool, and confirm channel settings.
	Are the encryption keys appropriately set?	You need to set the same encryption keys. Open the configuration tool, and write in encryption keys again.
It does not communicate in 802.11 Ad-Hoc mode.	Is the appropriate SSID set?	You need to set the same SSID with that of other Wavit11.Open the configuration tool, and confirm the SSID.
	Are the encryption keys appropriately set?	You need to set the same encryption keys. Open the configuration tool, and write in encryption keys again
It does not communicate in Infrastructure mode.	Is the appropriate SSID set?	You need to set the same SSID with that of Access Point. Open the configuration tool, and confirm the SSID.
	Are the encryption keys appropriately set?	You need to set the same encryption keys. Open the configuration tool, and write in encryption keys again
It does not communicate in Both mode.	Is the channel set appropriately?	You need to set the same channel in Both mode. Open the configuration tool, and confirm channel settings.
	Are the encryption keys appropriately set?	You need to set the same encryption keys. Open the configuration tool, and write in encryption keys again.
It does not communicate in Access Point mode.	Does the SSID fit to the client SSID?	You need to set the same SSID with that of the client. Open the configuration tool, and confirm the SSID.

	Are the encryption keys appropriately set?	You need to set same encryption keys. Open the configuration tool, and write in encryption keys again.
It does not communicate in Wireless Bridge mode.	Is the channel set appropriately?	In Wireless Bridge mode, you need to set the same channel. Open the configuration tool, and confirm the channel.
	Was the MAC address properly set?	You need to set the target MAC address correctly. Open the configuration tool, and confirm the MAC address.
	Are the encryption keys appropriately set?	You need to set the same encryption keys. Open the configuration tool, and write in encryption keys again.
It does not communicate in all modes.	Was the network configuration of Personal computer set properly?	Refer to Operating System User's Manual.
	Does it communicate properly when personal computers are connected to each other with 10BASE-T cross cable?	Refer to the Operating System User's manual and configure the networks.
	Can Wavit11s make communication when they are installed in the neighborhood?	The distance is too far. Change the Wavit11 position to enable the communication.
The configuration tool does not start.	What is your operating system?	For configuration tool, you need Windows95+IE4.01 or above.
Setting is not feasible with the configuration tool.	Can you find Wavit11s on the screen in the top window of configuration tool?	Connect personal computer and Wavit11 using 10BASE-T straight cable.
	Is the TCP/IP protocol installed to your personal computer?	Refer to User's manual of the personal computer to install the TCP/IP protocol to your personal computer.
	Is the network address of Wavit11 IP address the same with that of the personal computer?	Open the configuration tool, and change the IP address so as to match the network address.
Was the unusable IP address set?		Open the configuration tool and perform initialization. After initialization, you need to set up all configurations again.
I have forgotten the password.		Open the configuration tool and perform the initialization. After initialization, you need to set up all configurations again.

13. Specifications

Item	Specification
Frequency	2,400 -2,483.5MHz
Channel	11
Modulation	CCK (Complementary Code Keying)
Interface	10BASE-T
Data Rate	11Mbps/5.5Mbps/2Mbps/1Mbps
Receive Sensitivity	-83dBm(11Mbps, FER=$8x10^{-2}$)
Output Power	15dBm
Temperature Range	0-40 Celsius
Standards	ARIB STD-T66 IEEE 802.11b
Supply Voltage	5.0V
Consumption Current	TX: 600mA RX: 330mA
Size	65(W) x88(D) x 29.9(H) mm, Antenna is excluded
Weight	110g

Range

Data Rate	Indoor	Outdoor
11Mbps	30m	60m
5.5Mbps	40m	80m
2Mbps	50m	100m
1Mbps	60m	120m

These ranges are estimated from the general environment. For Wavit11 installation, refer to the above and confirm the communication.

Performance

The performance is measured on the application. The performance varies according to PC power, network interface card power, installation environment, wireless network traffic and external noise. On condition that setting is made in the following environment: Ad-Hoc, Windows SE and TCP/IP protocol, the highest performance of the Wavit11 will be given at around 5Mbps.