

How to Setup wireless EtherNet/IP Messaging with ControlLogix



RLXIB-IHW Industrial Hotspot 802.11abg

Introduction

To carry out the wireless communication between 2 ControlLogix PLC, 2 ProSoft Technology modules RLXIB-IHW-E RadioLinx Industrial Hotspot 802.11abg are used.

For the architecture of this implementation, we used:

- 2 modules RLXIB-IHW-E
- 2 ControlLogix with 2 1756-ENBT/A card.
- A laptop equipped with RSLogix 5000.
- 1 Ethernet Switch (needed to do a wired communication test)

This document gives the details of the implementation of the system.

Note:

RLXIB-IHW-E has AP (Access Point) mode available (See end of the technical note).



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Where Automation Connects.



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

Architecture





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Procedure

Note:

If your PC is not connected to a DHCP server or directly connected via Ethernet to the radio module, **DO NOT FORGET TO ASIGN A FIXED IP ADDRESS** to the PC Ethernet card.

Here are the basic steps needed to establish communications:

A. Setting of the Main Radio.

A.1. Install RadioLinx IH browser:

Download RLX-IH Browser from: <u>http://www.prosoft-technology.com/content/download/12739/165690/file</u>

Then install the Browser on your PC.

A.2. Plug the cables to the RLXIB-IHW:



From left to right: Power connector, serial port and Ethernet port.

Plug the power cable.

For Ethernet connection:

- If you are connecting to the radio through an Ethernet hub or switch, use the gray (straight-through) cable.
- If you are connecting to the radio directly from your PC without going through an Ethernet hub or switch, you must use the red (crossover) cable.



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A.3. Launch RadioLinx IH browser:

Click on the binocular:

	Ra	dioLinx Industrial Hotsp	oot Browser							
ł	ile C	perations Dialogs View H	Help							
	# `		= K 🖵 🕭 🕭 🔍	908						
Г	Name	Mode	MAC	IP SSID	Security	Channel	Hops Signal Tx (KB/s)	R× (KB/s)	Master	Associ.

The radio appears:

🔥 RadioLir	🔈 RadioLinx Industrial Hotspot Browser											
<u>File O</u> peratio	Elle Operations Dialogs View Help											
M 🔌 🕫	🗢 🗜 🖥 🖾	■ & 🖳 🍋 🔺 🭳	Q Q D ?									
Name	Mode	MAC	IP	SSID	Security	Channel	Hops	Signal	Tx (KB/s)	R× (KB/s)	Master /	Associ
fmailhareir	n510m This Utility	00.0f.1f.c6.50.cd	192.168.170.11									
R Radio1	Repeater	00.0d.8d.f0.1d.c3	192.168.170.186	Network1	none	11	15	-100	0	0		
Second Res												_
<			Ш									>
RadioLinx Indu	strial Hotspot Browser										NUM	1.3

At this point the setting of the radio is the factory default. If the radio is connected to a network with a DHCP server, the radio may already have an IP address assigned to it.

🛦 RadioLinx Industrial Hotspot Browser												
Elle Operations Dialogs View Help												
M 🔌 🕫	🛥 🗜 🖥 😭	■ % 🛄 🏞 🛓 🔍 🤄	2 2 6 ?									
Name	Mode	MAC	IP	SSID	Security	Channel	Hops	Signal	Tx (KB/s)	Rx (KB/s)	Master	Associ
fmailharein5 R Radio1	510m This Utility Repeater	00.0f.1f.c6.50.cd 00.0d.8d.f0.1d.c3	192.100.170.11	Network1	none	11	15	-100	0	0		
<												>
RadioLinx Indus	trial Hotspot Browser										NUM	



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

If no IP address appears:

• Select the Radio on the list

🙏 RadioLinx Ind	🛦 RadioLinx Industrial Hotspot Browser											
Ele Operations Dialogs View Help												
🚧 🔌 🍘 🚧	7e 🔓 😭	≡ % ⊒ & ⊀ 🤉	Q Q D 9									
Name	Mode	MAC	IP	SSID	Security	Channel	Hops	Signal	T× (KB/s)	Rx (KB/s)	Master	Associ
fmailharein510m	This Utility	00.0f.1f.c6.50.cd	192.168.170.11									
R Radio1	Repeater	00.0d.8d.f0.1d.c3	192.168.170.186	Network1	none	11	15	-100	0	0		
<												>
RadioLinx Industrial H	lotspot Browser										NUM	1.3

• Then from Operations menu, select Assign IP



• The following window is displayed:



• Click OK to accept the temporary IP address, subnet mask, and default gateway.

The following message is displayed; click "OK" to continue.

Access Point utility

This IP address is temporary and will only be in effect until the next time the AP is reset. To set the IP Address permanently please modify the settings
through the Web Management Interface.

OK Annuler

Now a temporary IP address is assigned to the RLXIB-IHW-E module.



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

A.4. Go online with the RLXIB-IHW-E for configuration:

To go online to the RLXIB-IHW for configuration (or diagnostics), from the Browser select the Radio1:

_ձ RadioLinx Ind	ustrial Hotsp	oot Browser										
Ele Operations Dialogs View Help												
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Name	Mode	MAC	IP	SSID	Security	Channel	Hops	Signal	T× (KB/s)	R× (KB/s)	Master	Associ
fmailharein510m	This Utility	00.0f.1f.c6.50.cd	192.168.170.11									
R Radio1	Repeater	00.0d.8d.f0.1d.c3	192.168.170.186	Network1	none	11	15	-100	0	0		
<												>
RadioLinx Industrial H	otspot Browser										NUM	1.3
RadioLinx Industrial H	otspot Browser										NUM	

Select the Connect option in Operation menu.



The following window is displayed:



Enter your password to log in to the radio and then press **Login**. The default **password** is password (lower case).



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The RLW-IHW-E configuration is protected by a login password. The default **password** is password (lower case).

To prevent unauthorized access to the radio configuration, you should change the default password when you have finished your configuration.

The following window is displayed:

Radio Configuration/Diagnostic Utility - Windows Internet Explorer											
GO - M	http://192.168.170.1	33/Confi	g_Diag.htm%dfbd08289878616	• + ×	Google						
Eichier Edition	<u>A</u> ffichage Fa <u>v</u> oris	<u>O</u> utils	2		Liens »						
🙀 🏟 🔜 Ra	adio Configuration/Diagr	nostic Ut	ility	6	🕯 🔻 🔝 🔹 🖶 🔹 🔂 Page 🔹 🎯 Outils 🔹 🎽						
ProS	oft		RADI	<mark>\$.</mark> OLINX [°] In	dustrial Hotspot™						
Radio Name: Radio1 Signal Strength: Scanning											
Radio MAC:	00.0D.8D.F0.26.4	7	Parent MAC:	none	Available Parents						
Firmware:	IB3_430		Branch Length:	n/a	Address Table						
Update every:	10 sec		# Radios Linked:	0	Port Status						
Up Time:	0 Day 1 Hr. 57 Mii	n. 4 Sec	Link Time:	n/a							
Radio I	Network Settings		Security Settin	gs	Radio Access Settings						
Radio Name:	Radio1		Encryption WPA-AES	-	Obtain IP address - DHCP						
Network SSID:	Network1		WPA phrase ****		C Use the following IP address						
C Master	11 (2462MHz)		WEP key 1 💌 ****		IP Address 192.168.170.183						
Repeater	Parent Link		MAC Filter Edit Filter		Subnet Mask 255.255.255.0						
	Parent Auto Select		Hide Network SSID		Def: Gateway 192.168.170.254						
C Client	€ Auto € Specify				Primary DNS 192.10.1.10						
Client MAC	00.00.00.00.00.00				Secondary DNS 50.0.0.0						
IGMP	Spanning Tree				SNMP						
	Advanced Cont	ig			Login Password						
	Serial Settings										
Appl	v Changes		Cancel Changes	1	Factory Defaults Help						
Configuration help Changes not Saved. Will disrupt ~60s											
Radio Name: 1 to 31 characters. For user's identification of radio only.											
L Terminé	erminé 🛛 🚺 🚺 🚺 Internet 🔍 100% 👻										



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A.5. Set up the Main RLXIB-IHW-E – Master mode

The master is the "root" or top-level radio in a network. You must have at least one master radio per network. For redundancy, you can assign more than one master to the network. **CRadio Configuration/Diagnostic Utility - Windows Internet Explorer CRadio Configuration/Diagnostic Utility - Windows Internet Explorer Configuration Affichage Configuration Affichage**

Radio Configuration/Diagnostic Utility Radio Configuration Help Radio Configuration Help	Eichier Edition	<u>A</u> ffichage Fa <u>v</u> oris <u>O</u> utils	2	Liens »
Radio Name: Radio1 Signal Strength: Scanning Radio Name: Radio1 Signal Strength: Scanning Radio MAC: 00.00.00.00.26.47 Parent MAC: none Available Parents Firmware: IB3_430 Branch Length: n/a Address Table Update every: 10 sec # Radios Linked: 0 Port Status Up Time: O Day O Hr. 1 Min. 15 Sec Link Time: n/a Radio Name: Radio1 Encryption WPA-AES Obtain IP address - DHCP WeP key 1 #### Master 11 (2462MHz) WEP key 1 #### Mac Filter Mac Filter Hide Network SSID Def: Gateway 192.168.170.16 Subnet Mack 255.255.255.0 Def: Gateway 192.168.170.254 Primary DNS 192.10.1.10 Secondary DNS 50.0.0.0 	🚖 🏟 🔥 🙀	adio Configuration/Diagnostic U	ility	🐴 🔹 🔝 👻 🖶 🔹 📴 <u>P</u> age 🔹 🎯 Outils 🔹 🎇
Radio Name: Radio1 Signal Strength: Scanning Radio MAC: 00.0D.8D.F0.26.47 Parent MAC: none Available Parents Firmware: IB3_430 Branch Length: n/a Address Table Update every: 10 sec # Radios Linked: 0 Port Status Up Time: O Day 0 Hr. 1 Min. 15 Sec. Link Time: n/a Radio Name: Radio1 Encryption WPA-AES Obtain IP address - DHCP Network SSID: Network1 WPA phrase ***** Obtain IP address - DHCP Use the following IP address Master 11 (2462MHz) WA phrase **** Obtain IP address - DHCP Use the following IP address MAC Filter Edit Filter MAC Filter MAC Filter Subnet Mask 255.255.00 Def. Gateway 192.168.170.254 Parent Auto & Specify Hide Network SSID MAC Filter Hide Network SSID Def. Gateway 192.168.170.254 Client Advanced Config Secial Settings Sociologic Secial Settings Sociologic Secial Settings Advanced Config Secial Settings Cancel Changes Factory Defaults Help App		٥̈́ţ,		Industrial Hotspot [™] 802.11abg
Radio MAC: 00.0D.8D.F0.26.47 Parent MAC: none Available Parents Firmware: IB3_430 Branch Length: n/a Address Table Update every: 10 sec # Radios Linked: 0 Port Status Up Time: O Day 0 Hr. 1 Min. 15 Sec. Link Time: n/a Radio Network Settings Security Settings Radio Access Settings Radio Name: Radio1 WPA-AES © Obtain IP address - DHCP Network SSID: Network1 WPA phrase © Obtain IP address IP Address 192.168.170.16 Subnet Mask 11 (2462MHz) MAC Filter MAC Filter IP Address 192.168.170.16 WEP key I #**** MAC Filter Hide Network SSID Def. Gateway 192.168.170.254 C Client Advanced Config SinMP SinMP SinMP SinMP SinMP Login Password Advanced Config Serial Settings Cancel Changes Factory Defaults Help Configuration help Changes not Saved. Will discupt ~80s Factory Defaults Help	Radio Name:	Radio1	Signal Strength:	Scanning
Firmware: IB3_430 Branch Length: n/a Address Table Update every: 10 sec # Radios Linked: 0 Port Status Up Time: 0 Day 0 Hr. 1 Min. 15 Sec. Link Time: n/a Port Status Radio Network Settings Security Settings Radio Access Settings Radio Name: Radio1 Encryption WPA-AES Obtain IP address - DHCP Use the following IP address IP Address 192.168.170.16 Subnet Mask: 255.255.255.0 Def: Gateway 192.168.170.254 Primary DNS 192.10.1.10 Client Advanced Config Secure Changes Factory Defaults Help Apply Changes Cancel Changes Factory Defaults Help	Radio MAC:	00.0D.8D.F0.26.47	Parent MAC: none	Available Parents
Update every: 10 sec # Radios Linked: 0 Port Status Up Time: 0 Day 0 Hr. 1 Min. 15 Sec. Link Time: n/a Radio Network Settings Security Settings Radio Access Settings Radio Name: Radio 1 Encryption WPA-AES Image: Control of Control Control of Control of Control Control of Control o	Firmware:	IB3_430	Branch Length: n/a	Address Table
Up Time: 0 Day 0 Hr. 1 Min. 15 Sec. Link Time: n/a Radio Network Settings Radio Access Settings Radio Name: Radio 1 Encryption WPA-AES Obtain IP address - DHCP Network SSID: Network1 WPA phrase **** Obtain IP address - DHCP Master 11 (2462MHz) WPA phrase **** Obtain IP address IP Address IP Address IP 2.168.170.16 Master 11 (2462MHz) MAC Filter Edit Filter Def. Gateway 192.168.170.254 Primary DNS 192.10.1.10 Client Auto © Specify Hide Network SSID Fit Filter Stone Stone IGMP Spanning Tree Advanced Config Stone Stone Stone Apply Changes Cancel Changes Factory Defaults Help Configuration help Charges not Saved. Will disrupt ~80s Factory Defaults Help	Update every:	10 sec	# Radios Linked: 0	Port Status
Radio Network SettingsSecurity SettingsRadio Access SettingsRadio Name:Radio 1Encryption WPA-AES O botain IP address - DHCPUse the following IP addressIP Address 192.168.170.16Subnet MaskSubnet M	Up Time:	0 Day 0 Hr. 1 Min. 15 Se	c. Link Time: n/a	
Radio Name: Radio1 Encryption WPA-AES © Obtain IP address - DHCP Network SSID: Network1 WPA phrase ***** © Use the following IP address © Master 11 (2462MHz) WPA phrase ***** P Address IP Addr	Radio I	Network Settings	Security Settings	Radio Access Settings
Network SSID: Network1 WPA phrase **** C Use the following IP address Master 11 (2462MHz) WPA phrase **** IP Address 192.168.170.16 Repeater Parent Link MAC Filter Edit Filter Subnet Mask 255.255.255.0 Parent Auto Select IHide Network SSID Def: Gateway 192.168.170.254 Client Auto C Specify IHide Network SSID Def: Gateway 192.10.10 IGMP Spanning Tree Advanced Config SinMP Login Password Serial Settings Cancel Changes Factory Defaults Help Configuration help Changes not Saved. Will disrupt ~60s Factory Defaults Help	Radio Name:	Radio1	Encryption WPA-AES	Obtain IP address - DHCP
• Master • Master • Parent Link • Parent Link • Parent Link • Parent Auto Select • Client • Auto • Specify Client • Auto • Specify Client • Auto • Specify Client • Spanning Tree Advanced Config Serial Settings • Cancel Changes • Cancel Changes • Changes not Saved. Will disrupt ~60s • Changes not Saved. Will disrupt ~60s • Changes • Changes	Network SSID:	Network1	WPA phrase ****	C Use the following IP address
• Repeater Parent Link Parent Auto Select Parent Auto Select • Hide Network SSID Subnet Mask 255.255.0 Def: Gateway 192.168.170.254 Primary DNS 192.10.1.10 Secondary DNS 50.0.0 Secondary DNS 50.0.0 Sourcel Changes SNMP Login Password SNMP Configuration help Changes not Saved. Will disrupt ~60s	C Master	11 (2462MHz)	WEP key 1	IP Address 192.168.170.16
Parent Auto Select Def: Gateway 192.168.170.254 Client Auto © Specify Client MAC 00.00.00.00.00 IGMP Spanning Tree Advanced Config Serial Settings Serial Settings Cancel Changes Factory Defaults Help Configuration help Changes not Saved. Will disrupt ~60s	Repeater	Parent Link	MAC Filter Edit Filter	Subnet Mask 255.255.255.0
C Client • Auto © Specify Primary DNS 192.10.1.10 Client MAC O0.00.00.00 Secondary DNS 50.0.0 IGMP Spanning Tree SNMP Advanced Config Serial Settings SnMP Serial Settings Cancel Changes Factory Defaults Help Configuration help Changes not Saved. Will disrupt ~60s Factory Defaults		Parent Auto Select	Hide Network SSID	Def. Gateway 192.168.170.254
Client MAC 00.00.00.00.00 Secondary DNS Social Secondary DNS </th <th>C Client</th> <th>Auto C Specify</th> <th></th> <th>Primary DNS 192.10.1.10</th>	C Client	Auto C Specify		Primary DNS 192.10.1.10
IGMP Spanning Tree Advanced Config SNMP Serial Settings Login Password Apply Changes Cancel Changes Factory Defaults Configuration help Changes not Saved. Will disrupt ~60s	Client MAC	00.00.00.00.00		Secondary DNS 50.0.0.0
Advanced Config Login Password Serial Settings Login Password Apply Changes Cancel Changes Factory Defaults Help Configuration help Changes not Saved. Will disrupt ~60s	IGMP	Spanning Tree		SNMP
Serial Settings Factory Defaults Help Apply Changes Cancel Changes Factory Defaults Help Configuration help Changes not Saved. Will disrupt ~60s Factory Defaults Help		Advanced Config		Login Password
Apply Changes Cancel Changes Factory Defaults Help Configuration help Changes not Saved. Will disrupt ~60s Factory Defaults Help		Serial Settings		
	Appl Configuratio	y Changes n help Cha	Cancel Changes	Factory Defaults Help
RSSI(Received Signal Strength Indication): Strength of the signal FROM THE PARENT radio.	RSSI(Received	I Signal Strength Indication):	Strength of the signal FROM THE PARE	NT radio.



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From the RadioLinx web page:

- Change the name of the radio to **Main Device**
- Change the SSID name to **Messaging Network**
- Select **Master** and leave the channel per default (11)
- For Encryption chose **WPA-AES** and enter your **WPA phrase**
- Enter a valid IP address and Subnet Mask



Now the new settings are ready, press **Apply Changes** to valid them. The following message may appear when pressing "**Apply changes**", click "**OK**".





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he RLXIB-I	HW-E reboots:					
🖉 Radio Configu	iration/Diagnostic Utility - Windo	ws Internet Explorer			<u>_ ×</u>	
GO - 🔀	http://192.168.170.16/Config_Diag.	htm%df66712d0c5ee1dd	🕶 🐓 🗙 Google		P -	
Fichier Edition	Affichage Favoris Outils ?				Liens »	
🚖 🏟 🔥 😹	adio Configuration/Diagnostic Utility		🙆 • 🔊	- 🖶 - 🔂 Page - 🍥	Outils 👻 🎽	
Dros	S∰*	RADIO	LINX° Industr	ial Hotspot™		
TECHNOL	0 G Y			802.11abg		
Radio Name:	Radio1	Signal Strength:	Scar	nning		
Radio MAC:	00.0D.8D.F0.26.47	Parent MAC:	none	Available Parents	1	
Firmware:	IB3_430	Branch Length:	n/a	Address Table	-	
Update every:	10 sec	# Radios Linked:	0	Port Status		
Up Time:	0 Day 0 Hr. 15 Min. 20 Sec.	Link Time:	n/a			
	Radio Settings	Have Been Update	d.			
	You may close t	his window now or w	ait for page to relo	ad.		
	Rad	io Powering Up Ma	ain device			
		Close				
			📑 👩 😜 Interne	et 🔍 1	00% 🕶	

Press **Close** on this window, the following screen is displayed:

Window	s Internet Explorer 🛛 🔣
?	The webpage you are viewing is trying to close the window. Do you want to close this window?
	Yes No

Press Yes.



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A.6. Settings verification:

• Select Clear to delete the current radio list



• Select the **binocular** to refresh the screen and get an update radio list



• When configured the name of the radio is preceded by an M (for Master) in the RLX-IH Browser.



The setting of the Master radio is finished.

• Disconnect the Ethernet cable from the radio.





How to Setup Wireless EtherNet/IP Messaging with ControlLogix

B. Setting of the Remote/Repeater radio

B.1. Plug the cables to the **RLXIB-IHW**:



From left to right: Power connector, serial port and Ethernet port.

Plug the power cable.

For Ethernet connection:

- If you are connecting to the radio through an Ethernet hub or switch, use the gray (straight-through) cable.
- If you are connecting to the radio directly from your PC without going through an Ethernet hub or switch, you must use the red (crossover) cable.



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

B.2. Launch RadioLinx IH browser:

Click on the binocular:

	RadioLinx Industrial Hotspot Browser												
File	e Ope	rations Dialogs View I	Help										
å	1	🖻 🗢 🗣 🗣 🖻	🗏 X 🖵 🏚 🛦 🔍 🕄 🛛	3 6 ?									
N	ame	Mode	MAC	IP	SSID	Security	Channel	Hops Signal	T× (KB/s)	Rx (KB/s)	Master	Associ.	

The radio appears:

🔥 Radi	🛦 RadioLinx Industrial Hotspot Browser												
<u>File O</u> p	Elle Operations Dialogs View Help												
M 🔌	e 🗧	¶e ¶a @"	■ & 🖵 🏝 🛓 🔍	Q Q D ?									
Name		Mode	MAC	IP	SSID	Security	Channel	Hops	Signal	T× (KB/s)	R× (KB/s)	Master	Associ
fmail	harein510m	This Utility	00.0f.1f.c6.50.cd	192.168.170.11									
R Radio	01	Repeater	00.0d.8d.f0.1d.c3	192.168.170.186	Network1	none	11	15	-100	0	0		
<u> </u>													2
RadioLinx	< Industrial Ho	otspot Browser										NUM	

At this point the setting of the radio is the factory default.

If the radio is connected to a network with a DHCP server, the radio may already have an IP address assigned to it.

🙏 Ra	adioLinx Ind	ustrial Hotsp	ot Browser										
Eile	Operations Di	ialogs ⊻iew <u>H</u>	<u>t</u> elp										
酋	' % 🗧 🐲	₽₽ []	≡ & ⊒ & ≮ 🤍	Q Q D ?									
Name	e	Mode	MAC	IP	SSID	Security	Channel	Hops	Signal	T× (KB/s)	Rx (KB/s)	Master	Associ
fm R Ra	nailharein510m adio1	This Utility Repeater	00.0f.1f.c6.50.cd 00.0d.8d.f0.1d.c3	192.168.170.186	Net vork1	none	11	15	-100	0	0		
<													>
RadioL	inx Industrial H	otspot Browser										NUM	



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

If no IP address appears:

Select	the	Radio	on	the	list	

🔥 RadioLinx	🛦 RadioLinx Industrial Hotspot Browser												
File Operations	Ele Operations Dialogs View Help												
M 🔌 🕫	🕶 🗣 🔓 📑	3 🗐 🕭 🕹 🔍 🤇	2 🛛 🗅 🦹										
Name	Mode	MAC	IP	SSID	Security	Channel	Hops	Signal	T× (KB/s)	R× (KB/s)	Ma	aster	Assoc
fmailharein51	IOm This Utility	00.0f.1f.c6.50.cd	192.168.170.11										
R Radio1	Repeater	00.0d.8d.f0.1d.c3	192.168.170.186	Network1	none	11	15	-100	0	0			
<													>
RadioLinx Industr	ial Hotspot Browser										NU	JM	

• Then from Operations menu, select Assign IP

🗻 R	adioLinx I	ndustria	ıl Hot	spot Browser	
File	Operations	Dialogs	View	Help	
#	Connect		P	■ & □ b	
Nan	Assign IP		F		
	Update Fi	irmware	00.05.45		
	Start Ping	J Session		00.01.11.0	
R	aalo i	коро	autor -	00.0d.8d.f	

• The following window is displayed:

Assign Temporary IP Address 🛛 🔹 🗙						
Radio Name	Radio1					
MAC Address	00.0d.8d.f0.12.af					
Subnet	255.255.248.0					
Gateway	192.168.7.4					
IP Address	192.168.2.101					
Unused IP's :	192.168.7.254 192.168.7.253					
Find More	192.168.7.252					
	192.168.7.250					
	192.168.7.249					
OK	Cancel					

• Click OK to accept the temporary IP address, subnet mask, and default gateway.

The following message is displayed; click "**OK**" to continue.

Access P	
1	This IP address is temporary and will only be in effect until the next time the AP is reset. To set the IP Address permanently please modify the settings through the Web Management Interface.
	OK Annuler

Now a temporary IP address is assigned to the RLXIB-IHW-E module.



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B.3. Go online with the RLXIB-IHW-E for configuration:

To go online to the RLXIB-IHW for configuration (or diagnostics), from the Browser select the Radio1:

🗻 RadioLinx Industrial Hotspot Browser													
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Name		Mode	MAC	IP	SSID	Security	Channel	Hops	Signal	Tx (KB/s)	R× (KB/s)	Master	Associ
fmailt	harein510m	This Utility	00.0f.1f.c6.50.cd	192.168.170.11									
R Radio	ə1	Repeater	00.0d.8d.f0.1d.c3	192.168.170.186	Network1	none	11	15	-100	0	0		
<													>
RadioLinx	: Industrial H	otspot Browse	r									NUM	1.33
fmailh R Radio	harein510m 51 : Industrial H	This Utility Repeater otspot Browser	00.0f.1f.c6.50.cd 00.0d.8d.f0.1d.c3 r	192.168.170.11 192.168.170.186	Network1	none	11	15	-100	0	0	NUM	

Select the Connect option in Operation menu.

🚓 RadioLinx Industrial Hotspot Browser								
File	Operations	Dialogs	View	Help				
#	Connect		S		8. 🖵 🏚 🔺 🖞			
Nan	Assign IP			MAC				
f	Start Ping	1		00.0f.1f.c6.50.cc				
R		коро	acor		00.0d.8d.f0.1d.c3			

The following window is displayed:



Enter your password to log in to the radio and then press **Login**. The default **password** is password (lower case).



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

The RLW-IHW-E configuration is protected by a login password. The default **password** is password (lower case).

To prevent unauthorized access to the radio configuration, you should change the default password when you have finished your configuration.

The following window is displayed:

🦉 Radio Configu	uration/Diagnostic Utility -	Windows Internet Explorer			
GO - 🛛	🔥 http://192.168.170.18/Config	g_Diag.htm%dff70a0833d072eb 💌 🛃	Google	P -	
Fichier Edition	Affichage Favoris Outils	?		Liens »	
🚖 🏟 ᇠ R	adio Configuration/Diagnostic Ul	ility	🔄 🏠 🔹 🖶 🔹 🔂 Page 🔹 🎯 🤇	Dutils 🚽 🌺	
<i></i>		A.			
ProS	oft	RADIOLIN	X [®] Industrial Hotspot™		
TECHNOL	OGY		802.11abg		
Radio Name:	Radio1	Signal Strength:	Scanning		
Radio MAC:	00.0D.8D.F0.26.65	Parent MAC: nor	Available Parents		
Firmware.	IB3_430	Branch Length: n/a	Address Table		
Up Time:	Dov 0 Hr 24 Min 24 Sc	# Radios Linked: 0	Port Status		
Badio I	Network Settings	Security Settings	Radio Access Setting	16	
Radio Name:	Radio1	Encryption WPA-AES	Ohtain IP address - DHCP	<u>, </u>	
Network SSID:	Network1	WPA obrase	C Use the following IP address		
C Master	11 (2462MHz)	WER Roy 1 1 ****	IP Address 192.168.17	0.18	
Repeater	Parent Link		Subnet Mask 255.255.25	5.0	
· Kepealer	Parent Auto Select		Def Gateway 192 168 17	0.254	
C Client	C Auto C Specify	Hide Network SSID	Brimon/DNS 102.10.1.1		
Client MAC	00.00.00.00.00.00		Phillip DN0 192.10.1.10		
IGMP	Spapping Tree		Secondary DNS [50.0.0		
	Advanced Config		SNMP		
	Carial Catting		Login Password		
	Senar Settings				
Арр	ly Changes	Cancel Changes	Factory Defaults H	elp	
Configuration help Changes not Saved. Will disrupt ~60s					
IP Address: IP Address currently assigned to the radio.					
Terminé			🗿 😜 Internet 🛛 🔍 10	0% • //	



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

B.4. Set up the Remote/Repeater RLXIB-IHW-E – Repeater mode

A RLXIB-IHW-E Remote/Repeater connects automatically to the best available parent radio on the network.

- \circ $\,$ Change the name of the radio to $\mbox{Remote Device}$
- Change the SSID name to **Messaging Network**
- Select **Repeater**.
- \circ $\,$ For encryption chose WPA-AES and enter your WPA phrase $\,$
- Enter a valid **IP address** and **Subnet Mask**

🖉 Radio Configu	ration/Diagnostic Utility -	Windows Internet Explorer		
🔆 🕑 ד 💽	http://192.168.170.18/Conf	ig_Diag.htm%dff70a0833d072eb		Google
<u>Fichier</u> <u>E</u> dition	<u>A</u> ffichage Fa <u>v</u> oris <u>O</u> util:	s <u>?</u>		Liens ×
🚖 🍻 🗻 👧	adio Configuration/Diagnostic l	Jtility	6	🕯 🔹 🗟 🔹 🖶 🔹 📴 Page 🔹 🎯 Outils 🔹 🎽
			.	
ProS	off	RAD	IOLINX [®] In	dustrial Hotspot [™]
TECHNOL	OGY			802.11abg
Radio Name:	Radio1	Signal Strength:		Scanning
Radio MAC:	00.0D.8D.F0.26.65	Parent MAC:	none	Available Parents
Firmware:	IB3_430	Branch Length:	n/a	Address Table
Update every:	10 sec	# Radios Linked:	0	Port Status
Up Time:	0 Day 2 Hr. 52 Min. 18 S	ec. Link Time:	n/a	
Radio N	Network Settings	Security Setti	ngs	Radio Access Settings
Radio Name:	Remote device	Encryption WPA-AES	-	O Obtain IP address - DHCP
Network SSID:	essaging network	WPA phrase Messa	ging	Use the following IP address
C Master	11 (2462MHz)	WEP key 1 🗾 🔭		IP Address 192.168.170.184
Repeater	Parent Link	MAC Filter Edit Filte		Subnet Mask 255.255.255.0
	Parent Auto Select	Hide Network SSID		Def: Gateway 192.168.170.254
C Client	🖲 Auto 🧲 Specify			Primary DNS 192.10.1.10
Client MAC	00.00.00.00.00			Secondary DNS 50.0.0.0
IGMP	Spanning Tree			SNMP
	Advanced Config	1		Login Password
	Serial Settings			
Appl	y Changes	Cancel Changes		Factory Defaults Help
Configuratio	n help Ch			
Hide Network S	SID: Check to hide SSID ir	n rf beacons so WLAN card so	ans can not se	ee this network SSID
erminé				Internet 🔍 100% 👻

Important: The Network SSID and WPA phrase are case sensitive.

Use **exactly** the same combination of upper case and lower case letters you entered for the RLXIB-IHW-E Main device, otherwise the Repeater radio will not be able to connect to the Master radio

Now the new settings are ready, press **Apply Changes** to valid them.



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

The following message may appear when pressing "Apply changes", click "OK".



The RLXIB-IHW-E reboots:



Press **Close** on this window, the following screen is displayed:

Window	s Internet Explorer 🛛 🔣
2	The webpage you are viewing is trying to close the window. Do you want to close this window?
	Yes No

Press Yes.



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

B.5. Settings verification:

<u>Select Clear to delete the current radio list</u>



• Select the **binocular** to refresh the screen and get an update radio list



• When configured the name of the radio is preceded by an R (for Repeater) in the RLX-IH Browser.



The setting of the Repeater radio is finished.

• Disconnect the Ethernet cable from the radio.





How to Setup Wireless EtherNet/IP Messaging with ControlLogix

C. <u>Connect laptop Client by wireless to the Access Point to check the</u> <u>wireless network.</u>

Note:

You have to setup a fixed IP address to the PC wireless card and this IP address must be compatible with the RadioLinx IP addresses previously setup.

In this application the PC wireless card IP address must be 192.168.170.20.

The laptop will establish communication with the best Access Point.

C.1. Select the Messaging Network.



The communication is established by wireless between the laptop and the access point.



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

C.2. Check connection in RadioLinx IH browser.

Select Topology Diagram to show on which radio the laptop is connected



The Laptop is connected to the Radio Remote device.

The 2 RLXIB-IHW-E are present on the wireless network, your wireless setup is done.



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

D. Programming Messaging instructions into the Client ControlLogix PLC.

CIP Data table Read and Write will be used to send/receive data from/to the Sever ControlLogix PLC.

D.1. Material Configuration.

Launch RSLogix 5000 and create a new project. Enter your material configuration into the I/O configuration folder





How to Setup Wireless EtherNet/IP Messaging with ControlLogix

D.2. Conditions for Message instructions

Into the MainProgram folder open the MainRoutine:



To periodically send/receive data from/to the CLX Server, a TON instruction will be used. Into MainRoutine, create a new rung and add a **TON** instruction:



Double click on the ? and then enter **tp1** Click Right on **tp1** and then select New **tp1**





How to Setup Wireless EtherNet/IP Messaging with ControlLogix

In the screen below select OK.

New Tag		
Name:	TP1	ОК
Description:		Cancel
		Help
_ Usage:	<normal></normal>	
Туре:	Base Connection	
Alias For:		
Data Type:	TIMER	
Scope:	CLIENT_PLC	
Style:		
🔲 Open Cont	iguration	

Then enter 500 into the Preset time.

 Timer On Delay Timer	TP1	-CEND
Preset Accum	500 < 0 <	CDN)

We will use the done bit of the Timer to enable/disable the messages instruction. Into the Rung 0 insert **XIO tp1.DN** as TON condition:





D.3. Create ControlLogix PLC tags.

With messaging instruction, tags are needed into the CLX client and the CLX server.

Selecting Controller Tags into the Controller folder and select **EditTags**, the screen bellow is shown:

	9	Scope: Di CLIENT_PLC	•	Show DPM_DE\	'_s1	ATUS_REGISTER,	STRING, ALARM, AL	ARM_ANALOO
		Name			Δ	Alias For	Base Tag	Data Type
	Þ							
Controller Fault Handler								

Create two tables of INT(100): Data_read_into_server

Data_write_into_server

So	cope: 🗊 CLIENT_PLC 💌 Show DPM_DEV_ST	ATUS_REGISTER, 9	STRING, ALARM, AL	ARM_ANALOG, ALARM_DIGITAL, AXIS	CONSUMED, AXIS	_GENERIC, A>	49
	Name 🛆	Alias For	Base Tag	Data Type	Style	Description	*
				INT[100]	Decimal		
				INT[100]	Decimal		

Then, create two tags with Data Type of Message:

MSG_READ MSG WRITE

s	coge: 🚺 CLIENT_PLC 🗨 Show DPM_DEV_ST	ATUS_REGISTER, S	STRING, ALARM, AL	ARM_ANALOG, ALARM_DIGITAL, AXIS	6_CONSUMED, AXIS	_GENERIC, AXI
	Name 🛆	Alias For	Base Tag	Data Type	Style	Description 🖌
	⊕-Data_read_into_server			INT[100]	Decimal	
	⊕-Data_write_into_server			INT[100]	Decimal	
	⊞-MSG_READ			MESSAGE		
				MESSAGE		

At this step, the needed tags into the CLX dient are defined.



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

D.4. Create Read MESSAGE instruction into the Client ControlLogix PLC.

Into the **MainProgram** folder open the MainRoutine:



Create a new rung, insert **XIC tp1.DN** and then add a **MSG Instruction**:





How to Setup Wireless EtherNet/IP Messaging with ControlLogix

Double click on the ? and then select MSG_READ into the tags list.





How to Setup Wireless EtherNet/IP Messaging with ControlLogix

Selecting the box into the MSG instruction allow you to show the Message configuration below.



- Change the Message Type to **CIP Data Table Read**.
- Change the Source Element to Data_read_by_Client (Client ControlLogix PLC memory area)
- Change Number Of Element to **100** (Data table size)
- Change the Source Element to **Data_read_into_Server** (Server ControlLogix PLC memory area)

Message Configurati	on - MSG_READ		
Configuration Commun	nication Tag		
Message <u>T</u> ype:	CIP Data Table Read	•	
<u>S</u> ource Element:	Data_read_by_Client		
Number Of <u>E</u> lements:	100 📫		
Destination Element:	Data_read_into_server	-	Ne <u>w</u> Tag
💿 Enable 🛛 Enable	e Waiting 🛛 🔘 Start	🔵 Done 🛛 D	one Length: 100
Error Code:	Extended Error Code:		Timed Out 🗲
Error Path: Error Text:			
	OK	Annuler	Appliquer Aide



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

Selecting the Communication tab allows you to set the path to join the Server ControlLogix

Message Configuration - MSG_READ	
Configuration Communication Tag	
Path: ETHERNET_IP, 2, 192.168.170.195, 1, 0 ETHERNET_IP, 2, 192.168.170.195, 1, 0	Browse
Communication Method © CIP Destination Link: C CIP With Source Link: Destination Node: Source ID Source Link: Destination Node:	0 🚔 0 🚔 (Octal)
Connected Cache Connections	
Turk Contraction Contraction Devel	
Enable Linable Waiting Start Done Done Done Code: Extended Error Code: Error Path: Error Text:	.engtn: 100 ned Out 🗲
OK Annuler App	liquer Aide

Set the Path to ETHERNET_IP, 2, 192.168.170.195, 1, 0 :

- ETHERNET_IP represents the PLC client ENBT Card IP address
- **2** represent the port number into the Ethernet card
- 192.168.170.195 represents the PLC server ENBT Card IP address
- **1** represent the backplane
- **0** represent the PLCs processor



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

D.5. Create Write MESSAGE instruction into the Client ControlLogix PLC.

Into MainRoutine, create a new rung, insert **XIC tp1.DN** and add a MSG Instruction:





How to Setup Wireless EtherNet/IP Messaging with ControlLogix

Double click on the ? and then select MSG_WRITE into the tags list.





How to Setup Wireless EtherNet/IP Messaging with ControlLogix

Selecting the box into the MSG instruction allow you to show the Message configuration below.



- Change the Message Type to **CIP Data Table Write**.
- Change the Source Element to **Data_write_Into_Server** (Client ControlLogix PLC memory area)
- Change Number Of Element to **100** (Data table size)
- Change the Source Element to **Data_write_by_Client** (Server ControlLogix PLC memory area)

Message Configurati	on - MSG_WRITE			×
Configuration Commu	nication Tag			
Message <u>T</u> ype:	CIP Data Table Write	•]	
<u>S</u> ource Element:	Data_write_into_server	-	Ne <u>w</u> Tag	.
Number Of <u>E</u> lements:	100 🗧			
Destination Element:	Data_write_by_Client			
💌 Enable 🛛 Enable	e Waiting 🛛 🔘 Start	🔵 Done	Done Length: 0	
 Error Code: Error Path: Error Text: 	Extended Error Code:		🔲 Timed Out 🗲	
	ОК	Annuler	Appliquer	ide



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

Selecting the Communication tab allows you to set the path to join the Server ControlLogix

Message Configuration - MSG_READ
Configuration Communication Tag
Path: ETHERNET_IP, 2, 192.168.170.195, 1, 0 ETHERNET_IP, 2, 192.168.170.195, 1, 0
Communication Method C CIP C DH+ Channel: Destination Link: CIP With Server Link: CIP With Server Link: CIP CIP With Server Link: CIP CIP CIP Content Con
Source ID Source ID ✓ Connected ✓ Cache Connections
Enable O Enable Waiting O Start One Done Length: 100
◯ Error Code: Extended Error Code:
OK Annuler Appliquer Aide

Set the Path to ETHERNET_IP, 2, 192.168.170.195, 1, 0 :

- ETHERNET_IP represents the PLC client ENBT Card IP address
- **2** represent the port number into the Ethernet card
- 192.168.170.195 represents the PLC server ENBT Card IP address
- **1** represent the backplane
- **0** represent the PLCs processor

Now the programming of the Client ControlLogix PLC is finished. Save the Project and download it into the ControlLogix Client PLC



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

E. Programming Messaging into the Server ControlLogix PLC

Launch RSLogix 5000 and create a new project. Enter your material configuration into the I/O configuration folder



E.1. Create data exchange table.

The Client CLX with the Message Instructions will read and write date into the Server CLX, so data tables need to be created into the Server CLX.

Selecting Controller Tags into the Controller folder and select **EditTags**, the screen bellow is shown:

		Scope:	Server_PLC	-	Sh <u>o</u> w	DPM_DEV_ST	ATUS_REGISTER,	STRING, ALARM, AL	.AF
	пΓ	Name	•			Δ	Alias For	Base Tag	[C
E Gontroller Server_PLC		۵							Г
🖉 Controller Tags	ŀ						1		-
Controller Fault Handler									
Power-Up Handler									

Create two tables of INT [100]:Data_read_by_Client - Data_write_by_Client

	Scope: Server_PLC 💌 Show DPM_DEV_ST	ATUS_REGISTER, S	STRING, ALARM, AL	ARM_ANALOG, ALARM_DIGITAL, AXIS
	Name 🛆	Alias For	Base Tag	Data Type
				INT[100]
Γ	- Data_write_by_Client			INT[100]

At this step, the tags required by the Server ControlLogix PLC are defined. Nothing else is required into the Sever CLX program. Save the project and download it into the ControlLogix Server PLC



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

F. <u>Test wire EtherNet/IP communication</u>

Connect the ControlLogix PLCs and the PC as below:



Go online with the two ControlLogix PLC.





How to Setup Wireless EtherNet/IP Messaging with ControlLogix

Into the two projects, click right on the Controller Tags and then select Monitor Tags



If you enter values into the Client CLX tag Data_write_into_server you should see these values into the Server CLX tag Data_write_by_Client.

If you enter values into the Server CLX tag Data_read_by_Client you should see these values into the Client CLX tag Data_read_into_server.

Your EtherNet/IP messages are up and running



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

G. Test wireless EtherNet/IP communication

Note:

You have to setup a fixed IP address to the PC wireless card and this IP address must be compatible with the RadioLinx IP addresses previously setup. In this application the PC wireless card IP address must be 192.168.170.20.

Insert the RLXIB-IHW modules as below to create the wireless network.

To connect directly the RadioLinx modules to the ENBT card, use Ethernet cross cables.



Connect the Laptop to the wireless Network **Messaging Network**. The laptop will establish communication with the best Access Point.

etwork Tasks	Choose a wireless network	
🛃 Refresh network list	Click an item in the list below to connect to a wireless network in range or to information.	o get more
Set up a wireless network for a home or small office	((Q)) Messaging Network	
	5 Security-enabled wireless network (WPA)	8000
telated Tasks		
Learn about wireless networking		
Change the order of preferred networks		
Change advanced settings		

The communication is established by wireless between the laptop and the access point.



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

Go online with the two ControlLogix PLC.



Into the two projects, click right on the Controller Tags and then select Monitor Tags

			_
🖃 🚖 Controller CLIE	ENT_PLC		
Controller	There		
Contr 🖉	<u>N</u> ew Tag	Ctrl+W	
Powe			
10000	Manihan Tana		
🖃 🔄 Tasks 🔰	Monicor Tags		
T 🗄 🚘 🗛 🗤			
📋 🖂 🖓 Main i	Edit Lags		
i i i i i i i i i i i i i i i i i i i	_		
	Verify		
	Export Tags		
i i 📔			
l 🧠 🗂	Print		
Unsch			



How to Setup Wireless EtherNet/IP Messaging with ControlLogix

RSLogix 5000 - Server_PLC in Server_PLC_BAK007.acd	[1756-L61]* - [Controller Tags - Server_PLC(controll	er)]		
Pile Edit View Search Logic Communications Tools Window	Help			
🛅 📂 🖃 🎒 👗 🖻 💼 🕬 👓 🔤 MVI56WAEIP.GetRadio	Status R 👻 💰 🗞 🗞 📴 💟 🛒 🔍 🔍			
em Burn Burn Mode Ren P	th: AB ETH-2\192.168.170.195\Backplane\0			
Encres				
	Exercises (Pit / Timer/Counter / Innut/Output / Compare	Compute Math	Moved origel / FileMin	-
			MOVE/LOgical A Tile/Mis	· <u>A</u>
Scoge: 📲 Server_PLC 🔍 Show DPM_DEV_STATUS_REGISTER, STRING, ALARM, ALARM_ANALOG, AL				
	Name 🛆	Value 🗲	Force Mask 🔶	Style
E Gontroller Server_PLC	Data_read_by_Client	{}	{}	Decimal
Controller Tags	+ Data_read_by_Client[0]	1		Decimal
Controller Fault Handler Power-Lip Handler	+ Data_read_by_Client[1]	0		Decimal
E-G Tasks	+-Data_read_by_Client[2]	- 12		Decimal
😑 🤕 MainTask	+-Data_read_by_Client[3]	0		Decimal
🖻 🥞 MainProgram	+ Data_read_by_Client[4]	0		Decimal
Program Tags	+ Data_read_by_Client[5]	0		Decimal
MainRoutine	+ Data_read_by_Client[6]	0		Decimal
🔀 RSLogix 5000 - CLIENT_PLC in CLIENT_PLC_BAK012.acd [1756-L61]* - [Controller Tags - CLIENT_PLC(controller)]				
🖉 File Edit View Search Logic Communications Tools Window Help				
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ioStatus R 🗸 🙈 🖪 The VIV C.C.			
Rem Run 📴 🗖 Run Mode	Path: AB_ETH-2\192.168.170.191\Backplane\0	5		
No Forces		<u></u>		
No Edits	H Hand Mag Gau Sau Iot			•
Redundancy 👦	🔪 Favorites 🔏 Add-On 🔏 Alarms 🔏 Bit 🥻 Timer/Counter 🗼	Input/Output 🖌 🖸	ompare 🔏 Compute/Math	K Mo
	Scope: TO CLIENT_PLC - Show DPM_DEV_	STATUS_REGISTER	, STRING, ALARM, ALARM	I_ANALOG
	I Name 4	Value 🗧	Force Mask	Style
Controller CLIENT_PLC	Data_read_into_server	{}	{}	Decimal
Controller Tags	+ Data_read_into_server[0]	1		Decimal
Power-Up Handler	+ Data_read_into_server[1]	(J	Decimal
E-G Tasks	+ Data_read_into_server[2]	12	2	Decimal
🖻 🧔 MainTask	+ Data_read_into_server[3]	(J	Decimal
E- 🕞 MainProgram	+ Data_read_into_server[4]	(J	Decimal
Program Lags	Data wood into converting			Desired

If you enter values into the Client CLX tag Data_write_into_server you should see these values into the Server CLX tag Data_write_by_Client.

If you enter values into the Server CLX tag Data_read_by_Client you should see these values into the Client CLX tag Data_read_into_server.

Your EtherNet/IP communication is up and running using the wireless connection

Congratulations

For further information feel free to contact **ProSoft Technology Technical Support** at one of the following addresses:

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