ECONET EC+ / EC++ Ethernet & WiFi Configuration



Application Note 024 Release 1.03 2021

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Introduction

This application note provides information about configuration methods and features for WiFi^{\circ} and Ethernet plug-in communication boards for Econet EC+/EC++ family.

The Turbo plug-in communication boards are available in three mounting variant: WiFi, Ethernet and WiFi + Ethernet. They are fully compatible with EC+ and EC++ Econet devices and have an on-board TCP/IP stack for ready-to-use interfacing at standard industrial networks.

Plug-In communication boards

Based on the "Plug-in Communication boards" are made up of a small board fitted into the Econet EC+/EC++ mainboards.

Developed around a single electronic board fitted in different variants, the communication board is mounted on the Econet EC+/EC++ motherboard. It is provided of an high performances microcontroller that handles a communication module. Thanks to its smart technology, the module takes care of handling all the information exchange tasks on the network.

Once the initial configuration has been performed, the Plug-In communication board automatically accesses at WiFi or Ethernet network and sends/receives serial data.

The WiFi version is based on Microchip RN171 stand-alone embedded wireless LAN access device module. The Ethernet version is based on Lantronix[®] DeviceLinx[®] XPort[®] device server module.

Here are listed the main Plug-In communication board features:

Ethernet board	WiFi board
GC XPorte Ref-24-49-19	
Connects devices through a TCP data channel or through a Telnet connection	Fully qualified and Wi-Fi certified 2.4 GHz IEEE 802.11 b/g transceiver
Supports UDP datagrams	FCC, CE, IC certified
Contains a web [HTTP] server allowing presentation of custom content and easy configuration through a browser.	4 μA sleep, 35 mA RX, 185 mA TX at 12 dBm (TX power <i>is</i> configurable)
ARP, UDP, TCP, ICMP, Telnet, TFTP, AutoIP, DHCP, HTTP, and SNMP for network communications and management.	On-board TCP/IP stack
TCP, UDP, and Telnet for connections to the serial port.	Output Power: 12dBm (programmable)
IP for addressing, routing, and data block handling over the network.	Secure Wi-Fi authentication via WEP, WPA-PSK (TKIP), and WPA2-PSK (AES)
User Datagram Protocol (UDP) for typical datagram applications	External antenna

Ethernet board configuration

In order to operate correctly on a network, the Ethernet Plug-In board must have a unique IP address on the network. To do this, there are two basic methods for logging into the Xport device server to assign an IP address and configure the module.

Method 1: Using DeviceInstaller

Assign an IP address and view the current XPort module configuration using a Graphical User Interface (GUI) on a PC attached to a network.

DeviceInstaller is a free utility software provided by Lantronix for configure, upgrade and manages Lantronix Device Servers. It can be downloaded from the Lantronix website at <u>www.lantronix.com/support/downloads</u>. For instructions on using DeviceInstaller to configure the IP address and related settings or for more advanced

features, see the DeviceInstaller Online Help.

To install DeviceInstaller:

- 1. Download the latest version of DeviceInstaller software from Lantronix site;
- 2. Run the executable to start the installation process;
- 3. Power ON the Econet device equipped with Ethernet plug-in board;
- 4. Connect the Ethernet cable at the Ethernet plug-in board header;
- 5. Check connection by mean of flashing green Leds on the header;
- 6. Launch DeviceInstaller software;

To Assign IP:

The device's IP address must be configured before it can work correctly on a network. Using DeviceInstaller software tool the user can manually assign the IP address over the network. The unit's IP address is normally set to 0.0.0.0 at the factory.

1. Double-click on DeviceInstaller.exe to launch the software;

E Lantronix DeviceInstaller 4.4.0.2RC3					_ _ X
File Edit View Device Tools Help					
🔎 Search 🤤 Exclude 🛭 🗞 Assign IP					
Lantronix Devices - 4 device(s)	Name	User Name	User Group	IP Address	Hardware Address
E gg Connessione alla rete locale (LAN) (10.0.0.164) E _ XPort	 XPort-05 XPort-05 XPort-05 XPort-IAP-05 			10.0.7 10.0.8 10.0.9 10.0.56	00-80-A3-A8-0D-DD 00-80-A3-AF-55-A7 00-80-A3-AF-55-98 00-80-A3-AF-92-D1
Ready	٠ [۲ ii.

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2. Click **Tools** \rightarrow **Options** \rightarrow flag ON the **Connect to local LAN** from the window list;

etwork Customization		
Name	IP Address	Subnet mask:
Connessione alla rete locale (LAN)	10.0.0.164	255.255.255.0
VirtualBox Host-Only Network	192.168.56.1	255.255.255.0

- 3. Click **Apply** and then the **OK** buttons;
- 4. Click the Xport folder. The list of available Lantronix Xport device displays;



5. Expand the Xport list and **select the RED Xport** unit by clicking on its IP address to view its configuration;

Search ◆ Exclude ▲ Assign IP ♦ Upgrade Image: Instruction Devices - 4 device(s) ● Ovice Details Web Configuration Telet Configuration Image: Application Cevices - 4 device(s) ● Ovice Details Web Configuration Telet Configuration Image: Application Cevices - 4 device(s) ● Ovice Details Web Configuration Telet Configuration Image: Application Cevices - 4 device(s) ● Ovice Details Web Configuration Telet Configuration Image: Application Cevices - 4 device(s) ● Ovice Details Web Configuration Telet Configuration Image: Application Cevices - 4 device(s) ● Ovice Details Property Value Image: Application Cevices - 4 device(s) ● Ovice Parally Value ● Ovice Parally Image: Application Cevices - 4 device(s) ● Ovice Parally XPort - IAP-05 ● Ovice Parally Image: Application Cevices - 4 device for the device ovice status ● Ovice Family XPort ● Ovice Family Image: Application Cevices - 4 device for the device for the device status ● Ovice Family XPort ● Ovice Family Image: Application Cevices - 4 devices - 00-30-A3-AF-92-D1 ● Ovice Family XPort ● Ovice Family > Ovice Cevices	File Edit View Device Tools Help			
Image: Second secon	🗅 Search 🛛 🤤 Exclude 🔌 Assign IP 🛛 🤡 Upgrade			
Connessione allar rete locale (LAN) (10.0.0.164)	Eartronix Devices - 4 device(s) Gronessione alla rete locale (LAN) (10.0.0.164)	Device Details We	eb Configuration Telnet Configur	ration
Prote: WPort-US - firmware v6.10.0.1 WPort-UAP-05 - firmware v3.3.0.1GC WPort-UAP-05 - firmware v4.3.0.1GC		Reload Details		
KPort-IAP-05 - firmware v3.3.0.1GC Konstant Sector 2010 0000 Konstant Sector 2010 Ko			Property	Value
Encode Set Encode Set Encode Set Encode Set Encode Set An encode accurated while attempting to retrieve the device status. Name XPort-IAP-05 Group Comments Device Family XPort Type XPort-IAP-05 ID YM Hardware Address 00-80-A3-AF-92-D1 Finimware Version 3.3.0 Extended Finiware Version 3.3.0.1GC Online Status Online IP Address 10.0.0.56	XPort-IAP-05 - firmware v3.3.0.1GC	Toon EL	EPPOP	An error accurred while attempting to retrieve the device configuration
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Group Comments Device Family XPort Type XPort-IAP-05 ID YM Hardware Address 00-80-A3-F-92-D1 Firmware Version 3.3 Extended Firmware Version 3.3.0.1GC Online Status Online IP Address 10.0.0.56			Name	XPort-IAP-05
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Extended Firmware Version 3.3.0.1GC Online Status Online IP Address 10.0.0.56			Firmware Version	3.3
Orline Status Online IP Address 10.0.0.56			Extended Firmware Version	3.3.0.1GC
IP Address 10.0.0.56			Online Status	Online
			IP Address	10.0.0.56





6. Select Assign a specific IP address and click Next;

	Assignment Method
	Would you like to specify the IP address or should the unit get its settings from a server out on the network?
RE	Obtain an IP address automatically
	TCP/IP Tutorial
ł	

7. Enter the IP address. The subnet mask display automatically based on the IP address. The user may change it. On a local network, the user can leave the Default gateway blank (all zeros). Click **Next**.

S Assign IP Address	and the second		X
	IP Settings		
	Please fill in the IP The subnet will be it for accuracy. Inc impossible for you disruption.	address, subnet, and gateway to assign the c filled in automatically as you type, but please correct values in any of the below fields can m ar device to communicate, and can cause netwo	levice. verify Jake it ork
	IP address:	192.168.1.25	
	Subnet mask:	255.255.255.0	
	Default gateway	0.0.0.0	
	Configuration info mask and default ; Address has been Address wizard to	rmation is not available for this device. The su gateway will not be able to be set. After the 1 est successfully, then return to this Assign IP set the subnet mask and default gateway.	bnet P
	<	Back Next > Cancel	

8. Click the Assign button and wait several seconds until a confirmation message displays. Click Finish.





9. Select the Xport device IP assigned from main window list and select **Ping** from the Tool menu. The results display in the Status Window. Click **Clear**;

🐠 Ping Device		×
IP Address: 10.0.0.56	Ping	Clear Status
Status:		
Reply from 10.0.56: bytes=32 time=Oms Reply from 10.0.56: bytes=32 time=Oms Reply from 10.0.0.56: bytes=32 time=Oms Reply from 10.0.0.56: bytes=32 time=Oms		~
٠		Þ
		Close

10. Close DeviceInstaller software, then power-Off/On the Econet device;

To Communicate on the network

- 1. Launch the user software (i.e. Turbo "PC-Panel);
- 2. Select the **TCP/IP** communication protocol;



3. Enter the device IP address, the reserved device port=502 and Press OK. The communication starts.

n PC Panel Appl	lication	100			-	-	
Connect Di	isconnect	Trend					
	UR	BO	Econet Version Version Version	Plus ma e SW Di e SW Co e HW Co	tr. splay entrale entrale	14000 1.0.7.0 33 1	
Pressi	ione	Stato Ing	ressi/Uscite		Stato	General	e
-0.036	KPa	Post-F Pan	el Connection Parameters		Modo	Operativo	Aut.
-0.36	mBar	Abilita	Host: 10.0.0.56		Stato	Operativo	Normale
2.6		Abilitazi	Port: 502	×		Attuatore	0/2
-3.0	11111H20	С т	imeout: 10000	×		T On [ms.]	200
-0.144	InCWC	All	OK Can	icel		T Off [sec]	2
					sione Polv	eri [gr/m3]	0.00
		[Nor	i Utilizzato]	_	[Non	Utilizzato]	0.00
		[Nor	i Utilizzato]		ou	T 4-20 mA	4.000
		Menu	Allarmi	St	op	i	12.20 28/02/2018
Panel '10.0.0.	56' connecte	ed (Port 502)					





Method 2: Using Web Manager

Through a web interface, configure the XPort and its settings using the XPort module's Web Manager.

- 1. Run DeviceInstaller software tool and search for the list of available Lantronix device servers;
- 2. Click on the Xport folder and select the Xport unit by clicking its hardware address;
- 3. In the right pane, click the Web configuration tab and **click on the green arrow** to load web page;
- 4. A dialog box appears to prompt for a User name and Password. Press OK to proceed;

Authenticat	ion Required 🛛 🛛 🔀
?	Enter username and password for http://172.19.205.3
User Name:	1
Password:	
	OK Cancel

5. After few seconds, the Web page displays.

XPo	rf	
<u></u>		Device Status
Network		
Server		
Serial Tunnel Hostlist	Product Information	
Serial Settings	Firmware Version:	V6.10.0.1
Connection	Build Date:	23-Oct-2014
Email	Network Settings	
Trigger 1 Trigger 2	MAC Address:	00-80-A3-94-61-6E
Trigger 3	Network Mode:	Wired
Configurable Pins	DHCP HostName:	< None >
Apply Settings	IP Address:	172.19.100.65
	Default Gateway:	172.19.0.1
	DNS Server:	172.19.1.1
Apply Defaults	MTU:	1400
	Line settings	
	Line 1:	RS232, 9600, 8, None, 1, None.

6. Select Network from the main menu on the left side, then enter the IP address and click OK button;

	Network Settings
Network Mode: Wired Only 💙	
IP Configuration	
Obtain IP address	automatically
Auto Configuration	n Methods
BOOTP:	Enable Disable
DHCP:	Enable Disable
AutoIP:	Enable Disable
DHCP Host Name:	
 Use the following 	IP configuration:
IP Address:	172.19.205.3
Subnet Mask:	0.0.0.0
Default Gateway:	172.19.0.1
DNS Server:	0.0.0.0
Ethernet Configuration	
🗹 Auto Negotiate	
Speed:	● 100 Mbps ○ 10 Mbps
Duplex:	● Full ◯ Half
	OK

7. Press Apply Settings from the main menu on the left side and wait the end of save procedure.



In order to operate correctly on a network, the WiFi Plug-In board must have a unique IP address on the network. To do this, there are two basic methods for logging into the RN171 WiFi device to assign an IP address and configure the module.

Method 1: Using Econet Serial Port

Assign an IP address and view the current WiFi module configuration using a standard Serial Communication software installed into a PC attached to the Econet device by mean of RS485 to USB adapter cable.

To configure WiFi module:

Using serial communication software tool (i.e. Docklight V1.9) the user can manually assign the IP address and set the most important WiFi parameters.

1. Double-click on Serial communication software executable to launch the software;

File Edit Run To	ols Help				
🗅 📽 🗟 🚭 🕨	= 🖻 🖉 🗛 🔀 🖉 🕸 🌡	2			
Communice Communice	tion port closed			Colors&Fonts Mode	CDM17 9600, None, 8, 1
Send Sequences			Connunication		
Send	Name	Sequence	ASCII HEX Decimal Binary		
Receive Securities					
Active Name	Sequence	Annuer			
rears reality	Sequence	- COMMA			
			<u>.</u>		

2. Double-click on COMxx port on the top right side of the toolbar to set the communication port;

Project Settings				
Communication Flow Control Communication Filter				
Communication Mode				
Send/Receive on Comm. Channel				
Choose a COM port from the list of available devices, or type a COM port from COM1 to COM256.				
CDM Port Settings				
Baud Rate 9600 V Data Bits 8 V				
Parity None Stop Bits 1				
Parity Error Char. (ignore)				
OK Cancel Help				

- 3. Connect the RS485 to USB adapter cable at the Econet Serial Port (42-41 terminals), Power-On the Econet device and start the serial communication software;
- 4. Using the Serial communication software, send a "\$\$\$"<CR> string and wait the WiFi plug-In board response;

```
16/03/2018 15:26:59.661 [TX] - $$$
16/03/2018 15:27:00.731 [RX] - CMD<CR><LF>
```

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   5. Send a "scan" < CR> string to perform a network scan;
              16/03/2018 15:25:09.805 [TX] - scan<CR>
              <4.41> <CR><LF>
              SCAN: Found 3<CR><LF>
              01,01,-85,04,1104,28,c0,64:59:f8:dd:11:d8,Vodafone-34318725<CR><LF>
              02,06,-67,04,3100,1c,00,46:d9:e7:0d:59:06,TURBO 2<CR><LF>
              03,11,-71,04,1104,18,40,30:91:8f:7c:8c:1b,Telecom-59820571<CR><LF>
              END: <CR><LF>
      Send a "set wlan ssid networkname "<CR> string to set the SSID;
   6.
              16/03/2018 15:30:21.184 [TX] - set wlan ssid networkname<CR>
              AOK<CR><LF>
              <4.41>
   7. Send a "set wlan pass passphrase"<CR> string to set the network password;
              AOK<CR><LF>
              <4.41>
   8. Send a "set wlan join 1" < CR > string to set the automatic association at the device Power-Up;
              16/03/2018 15:34:44.878 [TX] - set wlan join 1<CR>
              AOK<CR><LF>
              <4.41>
   9. Send a "set ip address xxx.xxx.xxx"<CR> string to set the WiFi plug-In static address;
              16/03/2018 15:35:30.678 [TX] - set ip address 10.0.0.58<CR>
              AOK<CR><LF>
              <4.41>
   10. Send a "set ip dhcp 0"<CR> string to force the WiFi plug-In module to use its stored static IP address;
              16/03/2018 15:36:10.238 [TX] - set ip dhcp 0<CR>
              AOK<CR><LF>
              <4.41>
   11. Send a "save" < CR> string to store setting into the WiFi plug-In module;
              16/03/2018 15:37:34.011 [RX] - ave<CR>
              <CR><LF>
              Storing in config<CR><LF>
              <4.41>
   12. Send a "reboot" < CR > string to reboot the WiFi module;
              16/03/2018 15:39:34.412 [RX] - boot<CR>
              < CR > < LF >
              *Reboot*wifly-EZX Ver: 4.41 Build: r1057, Jan 17 2014 10:23:54 on RN-
              171<CR><LF>
              MAC Addr=00:06:66:9c:9b:15<CR><LF>
              *READY*<CR><LF>
              Auto-Assoc TURBO 2 chan=6 mode=MIXED SCAN OK<CR><LF>
              Joining TURBO 2 now..<CR><LF>
              Associated! < CR > < LF >
              Using Static IP<CR><LF>
              Listen on 2000<CR><LF>
To Communicate on the network:
   1. Launch the user software (i.e. Turbo "PC-Panel);
   2. Select the TCP/IP communication protocol;
```

```
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```

3. Enter the **device IP address**, the reserved device **port=2000 (WiFi dedicated)** and Press OK. The communication starts.

Connect Disconnect	BOD M	matr. Version Version Version	e SW Displa e SW Centra e HW Centra		
Pressione	Stato Ingre	ssi/Uscite		Stato General	e
KPa mBar mmH2O InCWC	Post-F Panel Abilita Abilitazi Ali Ali Ali Non L [Non L	Connection Parameters Host: 10.0.0.58 Port: 2000 eeout: 10000 OK Car Ptilizzato] Ptilizzato]		Modo Operativo Stato Operativo Attuatore T On [ms.] T Off [sec] ne Polveri [gr/m3] [Non Utilizzato] OUT 4-20 mA	
	Menu	Allarmi	Stop	i	15.44 16/03/2018

Method 2: Using Web Browser

Through a web interface, configure the WiFi plug-In settings using a common Web browser.

- 1. Power-On the Econet device;
- 2. Press and release the "S2" pushbutton placed on the WiFi plug-In board;



- 3. Check if the led information is switched from "Stand-By mode" to "Launch Soft AP mode". Now the WiFly Web-Server is available for configuration activities;
- 4. Connect the PC or Smartphone at the WiFly open network created by the WiFi piggy-back board;

Currently connected to: WiFly-EZX-51 No Internet access	÷2	•
Dial-up and VPN	^	
3G Connection	×	
Wireless Network Connection	^	=
WiFly-EZX-51 Connected	31	
rohot-ac	al.	
dantooine	all	
ShyCat	al	-
Open Network and Sharing Cen	ter	

No password are needed. The WiFly is an open network.

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Once the PC or smartphone is connected at the Wifly Web-Server, the led information will switch from "Launch Soft AP mode" to "Client associated with AP network".

5. Open the Web browser on the PC or Smartphone and write <u>http://config</u>.

The led information will switch form "Client associated with AP network" to "Web Browser launched on the Client".

A configuration window will appear;

3 ITA 🗹 🕨		î.∥ ⊑) 09:39
Config			
Міскоснір			
Network Cfg Information			
Network Mode Client (Infrastructure)			~
Available Access Point	s:		
Click 'Refresh List' to popula Refresh List Access Point SSID	ite		
Security Mode			~
Passphrase			
Show Passphrase			
Use DHCP (recomme	nded)		
Save & Reboot Cancel		Display Advance	ed Tabs
©	2013 Microchi	p	
\bigtriangledown	0		

6. Press "Refresh List" button to refresh the SSID network list;

Network Cfg Informat	ion			
Network Mode				
	nints:			
Telecom-59820571 TURBO 2	JIII.3.			
Refresh List Access Point SSID TURBO 2				
Security Mode				
Passphrase				
Show Passphrase	2			
Use DHCP (recom	mended)			
Save & Reboot Cancel		D	splay Advanc	ed 1
	© 2013 <u>Mic</u>	rochip		

- 7. Select your SSID network. It will appear into the "Access Point SSID" text-box. Insert the password into the "passphrase" text-box and then press the "Save & Reboot" button.
- 8. Checking the "Display Advanced Tabs", the user can enable some advanced tabs to access to the extended information. Accessing "Information" Tab, the WiFi Module-Type and the MAC address will be displayed.
- 9. Accessing "Module Cfg" Tab, the Device ID name and the serial port configuration will be displayed;
- 10. Accessing "Terminal" Tab, the user can configure the WiFi module using the same strings used with Method1. At the end of strings input, press "Save & Reboot" button to store configuration.

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Appendix A – Revision History

Version draft	First draft	Dec 2017
Version 1.0	First Release	Mar 03, 2018
Version 1.01	Added Led information at Method2 of WiFi board configuration	Nov 05, 2018
Version 1.02	Added item 10 at page 9 to set dhcp=0 to force to use static IP address	Nov 13, 2018
Version 1.03	Updated Turbo HQ Address	Nov 03, 2021