

# LAN485 and WIFI485

Converter RS485 to LAN  
Converter RS485 to WIFI

version 1.1

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## 1. Device description

BMR WiFi485 converter of communication line RS485 to WiFi and it is primary designed for usage with BMR devices equipped by RS485 port. By usage of this converter it is possible to establish communication between software installed at PC with WiFi card and remote device.

Converter works in TCP server mode. It listen on set port and transfer data communication to local RS485 port. On the other side when it is received request from local RS485, converter transfers it to created networked socket. Communication flow switching is automatic.

BMR WiFi485 supports secure access into WiFi network. It is also possible to use older security WEP 64, 128 bit or recommended encryption standards WPA-TKIP, WPA2-AES protocol.

BMR WiFi485 converter can be incorporated into existing network or be used as Ad Hoc station (network between computers, only WEP encryption).

Converter works in TCP server mode when listens to communication at defined port. Communication at that port is forwarded to local RS485 port. On the other hand when the request from local RS485 port is received, the request is forwarded to established network socket on communication port. Communication direction switching is automatic time independent.

## 2. Connection requirements

For correct function of remote control is necessary to follow certain rules:

1. **Set IP address of converter has to be visible from remote PC.** If converter and PC with application for BMR devices is placed in the same address network segment, there is no need to make any other special network configuration.



### Example of company network

*Company network has typically defined address class C for local networks 192.168.X.X. Therefore converter will have address, for example such as 192.168.1.112 and subnet mask 255.255.255.0. Personal computer where the software for communication is installed will have address, for example 192.168.1.2 and subnet mask 255.255.255.0. Then the accessibility of converter is possible test by command 'ping 192.168.1.112'.*

*For some devices, such as ADSL modems or AP, the address class A is set. In this case the address of converter has to be in class A format 10.X.X.X. The converter IP address has to be set in that range.*

*Also the subnet mask has to be the same for converter and the PC. Subnet mask define the network membership.*

*In case that BMR converter is connected to the different network segment than PC, it is necessary create the path in ethernet in order to establish accessibility between converter and PC. If the converter is located in the company network and PC or laptop is accessing the converter from internet or other place, network administrator has to create the path on the router-firewall for publishing the public address communication port to the local address converter port (forwarding).*

2. **Converter IP address has to be static (manually set).** It is not possible use DHCP server for assigning the converter IP address. In case of usage of DHCP server the converter should have all the time different IP address and virtual port could not create connection.
3. **On remote PC has to be installed virtual serial port or application has to be able directly access TCP/IP protocol.** Virtual serial port is software application which creates another serial port, for example COM5. Communication of this port is transferred via Ethernet network to remote LAN485 converter.

## 3. Default converter configuration

Converter LAN485 is delivered in following default configuration:

- IP address (DIP): 192.168.1.112
- Subnet Mask (SNET): 255.255.255.0

- Gateway Address (IPG): 0.0.0.0
- Infrastructure SSID: not entered
- Authentication Type: open system
- TCP port pro web configuration: 80 (<http://192.168.1.112/ichip>)
- Password for web configuration: 1234
- TCP port on which converter listen to communication (LPRT): 60000
- TCP port pro configuration via *ichipConfig* (LATI): 60001
- Communication speed of local RS485 network: 9600 baud (BDRF=5)
- Data flow control: disabled (FLW=4)
- SerialNET: enabled

Converter WIFI485 is delivered in following default configuration:

- IP address (DIP): 192.168.1.111
- Subnet Mask (SNET): 255.255.255.0
- Gateway Address (IPG): 0.0.0.0
- Infrastructure SSID: not entered
- Authentication Type: open system
- TCP port pro web configuration: 80 (<http://192.168.1.111/ichip>)
- Password for web configuration: 1234
- TCP port on which converter listen to communication (LPRT): 60000
- TCP port pro configuration via *ichipConfig* (LATI): 60001
- Communication speed of local RS485 network: 9600 baud (BDRF=5)
- Data flow control: disabled (FLW=4)
- SerialNET: enabled

#### 4. Configuration possibilities

Installation and configuration should be performed only by authorized person. Converter can be configured by several different ways. In fact, converter is managed by AT commands sent by local RS485 network or by ethernet. Configuration AT commands have special syntax in order to avoid mistake with standard commands for modem operation. Hereafter written configuration options use such AT commands.

Configuration options:

- Recommended configuration variant. Converter has its own web-server for setting all parameters. Web-server is available on native IP address at port 80, for example <http://192.168.1.111/ichip>.
- For complete configuration there is available software *ichipConfig*. Software access converter via RS485 side by USB/RS485 or RS232/RS485 converter or via network socket on predefined TCP port 60001 (parameter LAT1).
- For complete configuration via AT commands it is possible use the command line and connection via USB/RS485 or RS232/RS485. For complete list of AT commands contact company BMR.



#### Warning

*If the converter is reset to the default settings, internal web-server will be disabled. Restart of internal web-server is possible only via RS485 interface. All configurations needed for running the BMR interfaces will be erased!*

## 5. LAN485 converter installation

Recommended procedure for LAN485 converter installation into existing LAN network:

1. Connect the supply voltage to convert and green LED turns on. Yellow LED will start blink at moment of connection to local network.
2. Test the converter accessibility by command ping 192.168.1.112 from PC command line.
3. Start internet browser and enter address `http://192.168.1.112/ichip`. If everything is correct then following window with converter setting will appear.
4. Set converter IP address (*parameter DIP*), subnet address (*parameter SNET*) and gateway address (*parameter IPG*) in case it is used.
5. Click on the Serial Net Parameters parameter in the page left menu and following window with converter serial interface setting will open.
6. Define the number of TCP port on which the communication between RS485 and LAN will be progressed (parameter LPRT). Default value: 60000 (it is recommended to keep the default value).



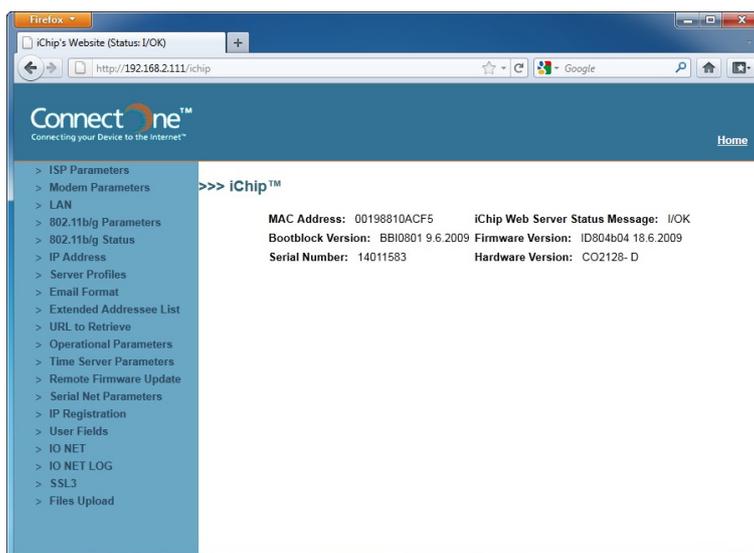
### Warning

*Modification of above listed parameters can make lost of connection to converter in the local network. Converter installation has to be done only by person with appropriate knowledge.*

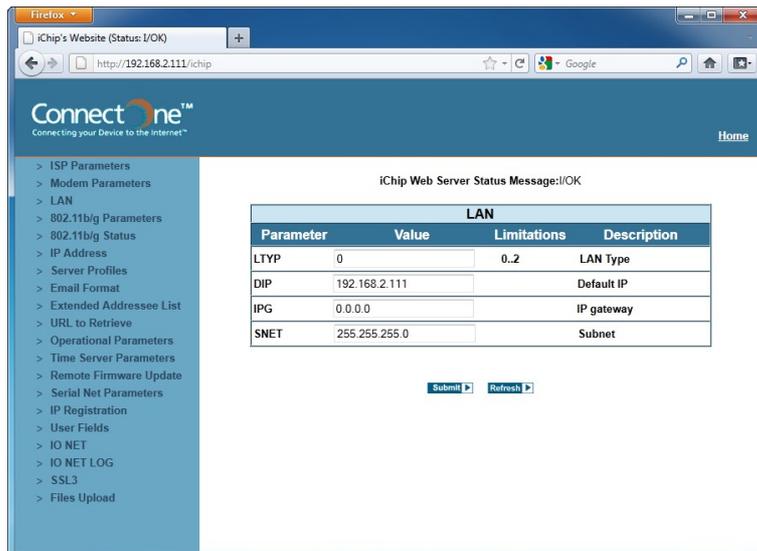
## 6. WIFI485 converter installation

Recommended procedure for WIF485 converter installation into existing WiFi network infrastructure:

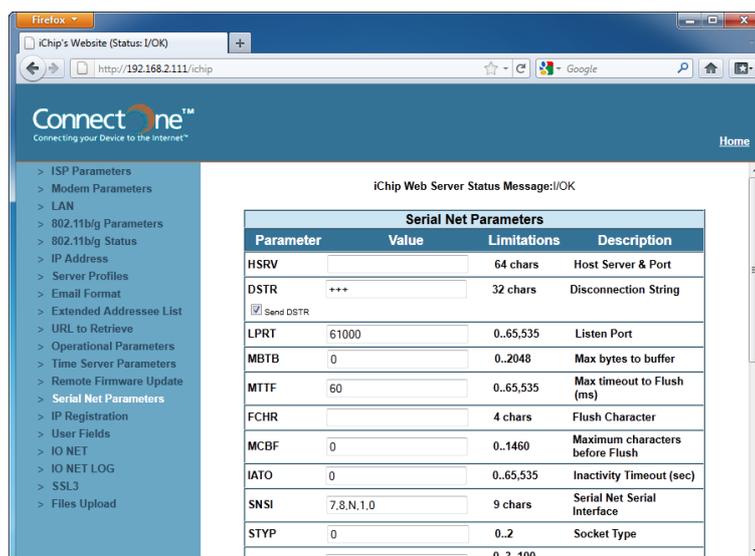
1. Configure the AP (access point) WiFi for open access without encrypting.
2. Configure the AP for network 192.168.1.X
3. Turn converter power supply on and green LED will light. Yellow LED starts blink and if it turns on after converter is connected to local network.
4. Test accessibility of converter in network by entering the command `ping 192.168.1.111`.
5. Start web browser and set address: `http://192.168.1.111/ichip`. If everything is correct, page with of converter configuration will appear.



6. Click on the LAN parameter in the page left menu and following window with converter IP will open.



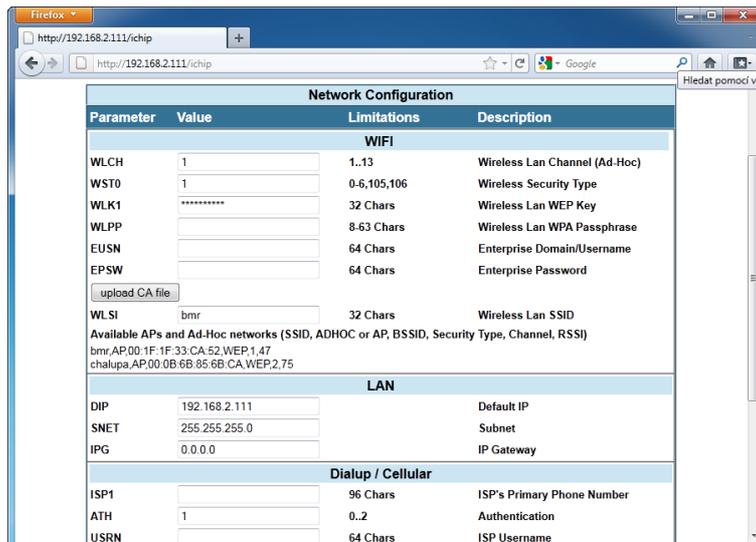
- Set converter IP address (*parameter DIP*), subnet address (*parameter SNET*) and gateway address (*parameter IPG*) in case it is used.
- Click on the Serial Net Parameters parameter in the page left menu and following window with converter serial interface setting will open.



- Define the number of TCP port on which the communication between RS485 and LAN will be progressed (*parameter LPRT*). Default value: 60000 (it is recommended to keep the default value).
- Set the wireless network SSID (*parameter WLSI*) or number of communication channel for Ad-hoc connection (*parameter WLCH*). If *WLCH=0* the infrastructure option is enabled.
- Wifi security protection is recommended to be set on WPA-TKIP protocol (*parameter WSEC=0*). For security protection WPA2-AES there set parameter *WSEC=1*.

**Warning**  
*Modification of above listed parameters can make lost of connection to converter in the local network. Converter installation has to be done only by person with appropriate knowledge.*

Security parameters configuration is accessible from different part of web settings. In the section Serial Net Parameters set the parameter *AWS* to value 203. Confirm the new setting by button Submit (enter the password 1234). Then refresh the web-page by key F5. Special configuration web-page dedicated for wifi security settings will appear.

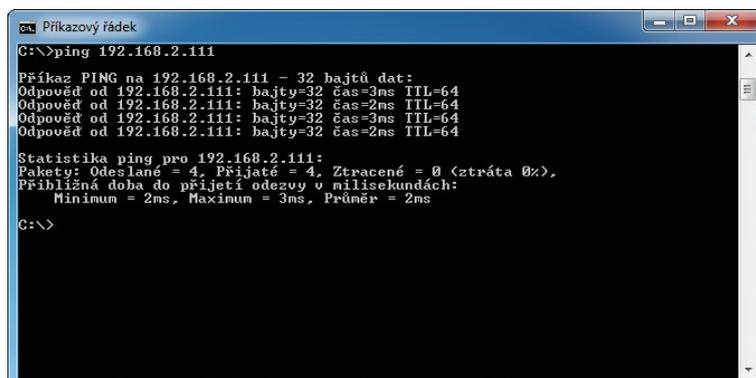


- WLCH if set on 0 then converter will connect to existing infrastructure. If set on different number then the Ad-Hoc connection for connection of two PC will be created.
- WST0 security type where value 1 = WEP64, 2 = WEP128, 3 = WPA-TKIP, 4 = WPA2 AES
- WLK1 WEP password
- WLPP WPA phrase
- WLSI network name
- DIP IP address
- SNET subnet
- IPG IP gateway
- AWS see above. NEZAPOMEŇTE NASTAVIT ZPĚT NA HODNOTU AWS=3 !

12. Set the same type of security on AP Wifi or in Ad-hoc connected computer. After restarting the AP Wifi the yellow LED on converter has to start light.

## 7. Connection troubles solving

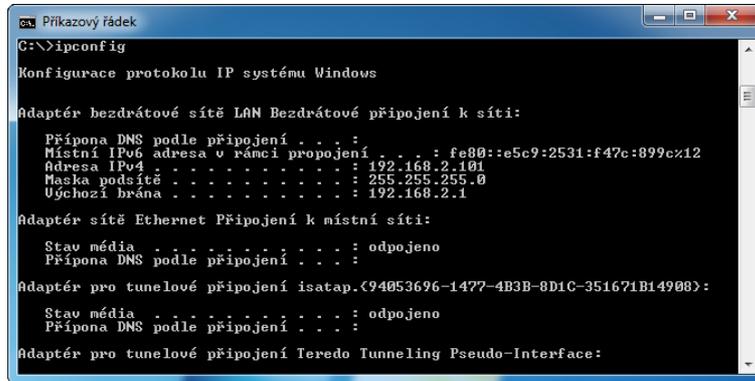
For correction operation of TCP/IP converter it is necessary that converter is visible in the ethernet network. Basic test of converter visibility is command "ping". If there is the response then converter is visible.



If there is no response from converter then converter is not visible in the network. Check following network configuration at PC and converter.

1. IP address cannot be the same as other in the local network
2. converter IP address has to be in the same range as the PC address

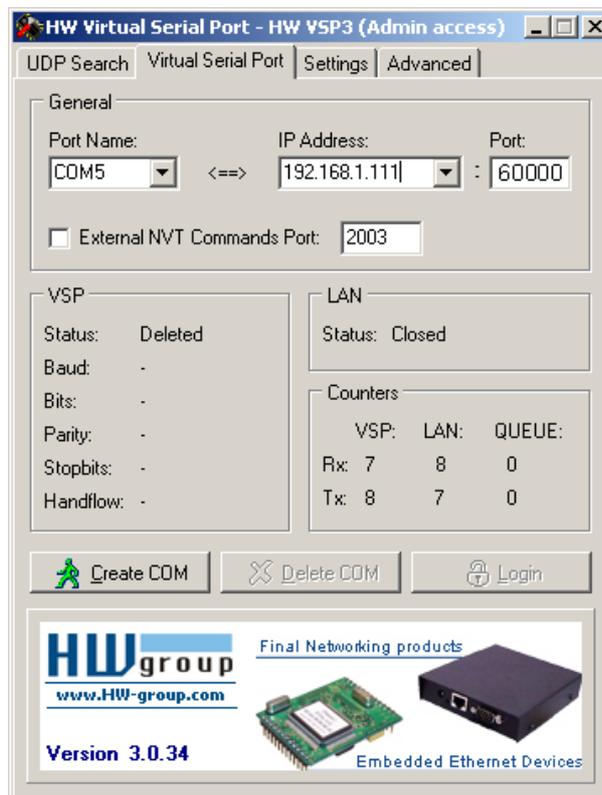
3. convert subnet address (parameter SNET) has to be the same as PC subnet address
  4. if the converter is used only in local network the IP gate is not set (IPG=0.0.0.0). If the converter is accessed for another network then the IP gate has to be set.
  5. For WIFI/485 converter the security settings has to be correct according to used wireless network
- Network configuration settings can be investigated by setting the command "ipconfig" in command line.



## 8. Virtual COM port installation

On PC or laptop with application for BMR devices has to be installed virtual COM port. Software for virtual comport is available on enclosed CD-ROM in folder VSP.

1. Start installation file 'HW VSP Setup 3.0.34 Single.exe'.
2. Install application by following the install wizard.
3. Start application *HW Virtual Serial Port* and set:



- **Port name.** Select the number of serial port. This port will be used in BMR software.
- **IP address.** IP address of WiFi converter.

- **Port.** Number of TCP port of converter where communication runs. See parameter LPRT.
4. Card *Settings* set according to following picture:



5. In the card *Virtual Serial Port* button 'Create COM'. If everything is correct, new COM port is created and it is connected via Ethernet network to converter BMR WiFi485.
6. In the BMR application for device control (Netreg, HM2006PC etc) set the newly created COM port.

## 9. LED diagnostic

LED status	LAN485	WiFi485
Yellow LED blinking	Communication in process	Trying connection to Access point
Yellow LED on	-	Connected to the Access point
Green LED on	Presence of power supply voltage	Presence of power supply voltage

## 10. Additional informations

### 10.1. SerialNET mode

Converter is based in the iChip processor and it can work in two operating modes.

1. Terminal, modem mode
2. SerialNET mode – data are transparently transmitted between local port and LAN or WIFI interface

For usage with BMR instruments the SerialNET mode is used. SerialNET mode extend the local asynchronous line over the TCP, UDP socket to LAN or internet network. In SerialNET mode the other transmission parameters are set. Convert with activated SerialNET mode behaves as a router between serial line and TCP/IP network.

## 11. Technical features

Parameter	Value
Power supply	230 VAC (+10%,-15%)
Power supply terminals	L, N
RS485 terminals	A, B
LAN terminals	RJ-45
Consumption	max. 1,5 VA
Power supply indication	green LED
Connection indication for WiFi485 converter	yellow LED
Working temperature	-20 ... +55 °C
Storage temperature	-40 ... +70 °C
Working position	any
Mounting	IEC 60715 (DIN 35)
Protection degree	IP 40 on panel / IP 20 terminals
Electrical strength	4 kV
Input wire diameter with / without cavern	max. 2 x 1,5 mm <sup>2</sup> ; 1 x 2,5 mm <sup>2</sup> / max. 2 x 1,5 mm <sup>2</sup> ; 1 x 2,5 mm <sup>2</sup>
Weight	200 g
Dimensions	90 x 54 x 65 mm
Standards	IEC 60255-6, IEC 61010



### Note

Complete documentation related to the used chipset is available on <http://www.connectone.com>.