

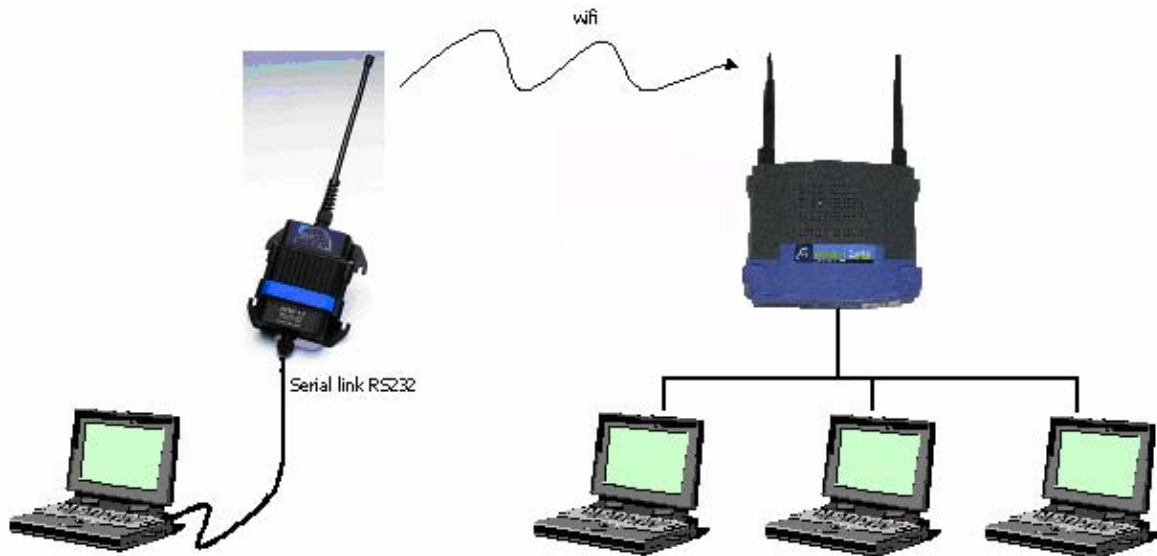
ARF42 User Guide



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OVERVIEW

The modem converts data from a serial link (Rx and Tx only) into TCP frames transported through the Wifi radio standard to an access point. Data can also be received from the access point and sent to the serial link.



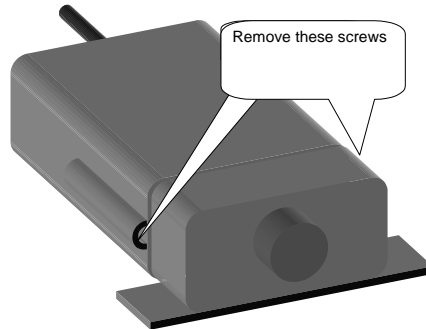
Communication between two modems is also possible using Wifi ad hoc mode:



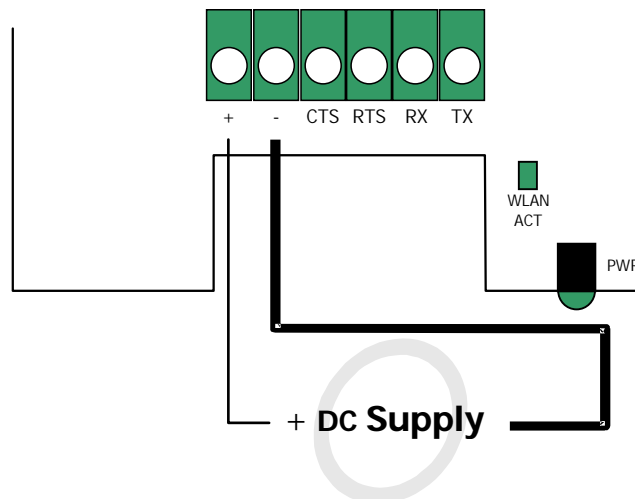
The operating parameters of these modems (serial link, WIFI and LAN management....) can be modified through a set-up software using a PC serial port or a LAN telnet port.

POWER SUPPLY

To perform wiring of these products, the bottom part of the housing (part with stuffing box) has to be opened by unscrewing the two stainless steel screws on each side.



The ARF 42 product must be supplied from a **DC voltage** source. This voltage source must be 8V minimum and must not exceed 30 V_{DC}.



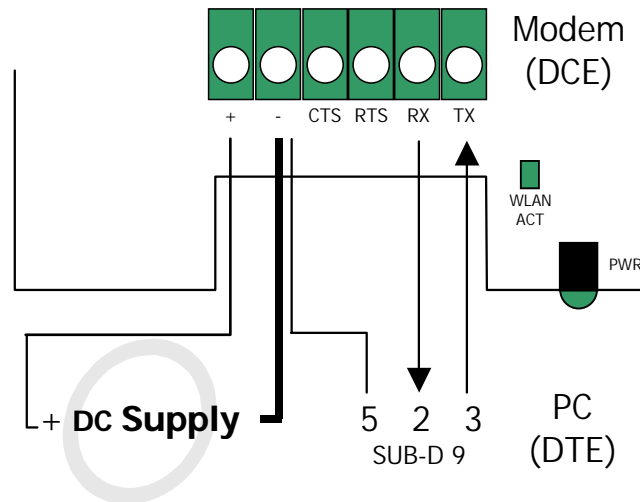
SERIAL LINK WIRING

The WIFI modem serial interface wiring is a two steps connection process:

- First connect the modem to a PC to set up modem configuration,
- then connect the modem to the final equipment for data transmission.

- **Connection during serial configuration phase**

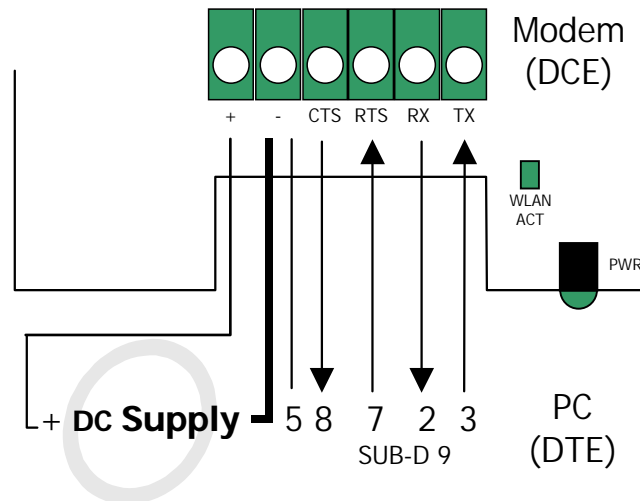
During initial configuration phase, the WIFI modem has to be connected on a PC COM port. The set-up configuration software does not require RTS/CTS wiring. The following scheme is an example of connection with a PC:



- **Connection for data transmission**

During data transmission phase, the WIFI modem is attached by its serial port to the final transmission equipment. If the hardware flow control has been selected during modem configuration phase, RTS and CTS lines have to be connected between both pieces of equipment.

The following scheme is an example where the modem is connected as a piece of DCE equipment to a DTE with hardware flow control handshake:



FUNCTIONNALITY

ARF 42 WIFI modem allows data transfer from a serial link over a WIFI network to an access point. The WIFI modem can be seen as a R232/WIFI gateway.

- **Set-up Mode**

The modem set-up mode can be entered using the “WIFI set-up software”. This is the only way to configure the modem.

Accessing modem set-up by serial port

Using serial port, the set-up mode of the modem can only be entered at power-up. The delay to enter this mode is limited to 3 seconds. After that, the modem automatically switches to transparent mode applying settings stored in its non-volatile memory. To re-enter set-up mode, the modem must be powered off and then powered on.

If the modem set-up mode must not be entered after power-up, no characters must be transmitted on the serial link during a minimum delay of 5 seconds.

Accessing modem set-up by telnet port

The telnet set-up mode can only be entered:

- if a minimal configuration has been previously set in the modem using the serial set-up mode
- if the modem is accessed through an access point that does not use WEP encryption and is connected to a LAN providing a DHCP server.

For any other kind of network configuration, a valid configuration must have been set in the modem by using the serial set-up: This includes the WLAN name, the encryption mode and the associated key for the Wireless parameters. The LAN parameters must also be set: IP address of the modem or DHCP mode, subnet mask and gateway. After that, the telnet configuration mode can be entered at any time after the modem has been powered.

Lost of connection during set-up phase

In case of LAN disconnection (LAN cable disconnected during set-up phase), the TCP connection is disconnected on the PC. The internal set-up modem is no more accessible through the network while its internal TCP connection time out is not reached. Once internal timeout reached, the connection is released from the modem side and the modem is ready to receive a new incoming set-up connection. The internal time out of the modem is fixed to 5 minutes. The modem set-up mode can then be re-entered by re-selecting the modem in the “WIFI set-up software” modem list.

The process to enter set-up mode is described step by step in the set-up software section.

- **TCP/IP connections**

The data transmission is performed through the LAN using TCP-IP protocol. The modem is ready to send or receive data when it leaves its set-up phase.

Connection of the modem on a remote server

The modem is ready to establish a remote connection after a delay of 5 seconds after a power-up or a set-up configuration phase.

The TCP communication is established by the modem when it receives any character from its serial link. On the first character reception, the modem tries to connect on the remote server specified by the remote IP and the remote port and data are transmitted. If the remote server can not be reached, data sent on the serial link are kept in the internal modem buffer (in the limit of its size) and are sent when the modem finally succeeded in connecting to the host.

The connection remains active while the modem is powered. If the host side disconnects, the modem re-attempts to connect until the connection to the host is successful.

Connection of a client on the modem

The modem acts as a server while it is powered. The modem is ready to accept an incoming connection after a delay of 8 seconds after power-up or a set-up configuration phase. There is no password to connect to the modem. The connection is never closed by the modem.

Reserved ports

The following TCP ports are reserved and must not be used:
1-1024, 9999, 14000-14009, 30704 and 30718.

WIFI MODEM SET UP SOFTWARE

Set-up software allows the configuration of various parameters of WIFI modems. This software runs under Windows 2000 and XP operating systems.

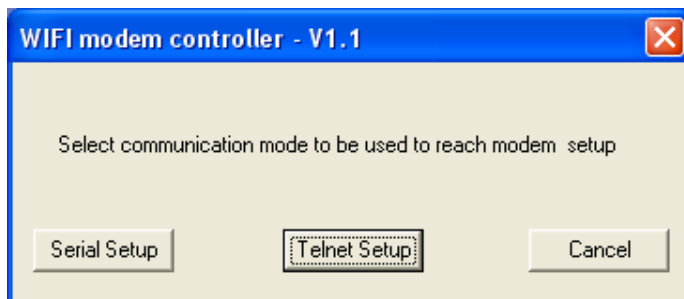
- **Setting the environment**

- The WIFI modem must be connected to the PC serial port if using serial set-up.
- The set-up software program does not require any installation phase.

- **Starting with the set-up software**

The set-up software is entered by a double click on the “WIFI Modem Setup.exe” file. The following step by step procedure must be applied to enter modem set-up mode:

- First select the set-up mode to use (serial or telnet)

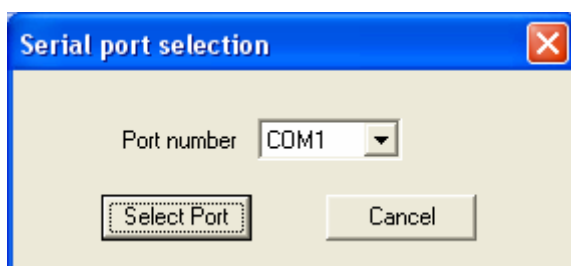


Configuration with serial port

- After selection of serial set-up, the following dialog appears on the screen:



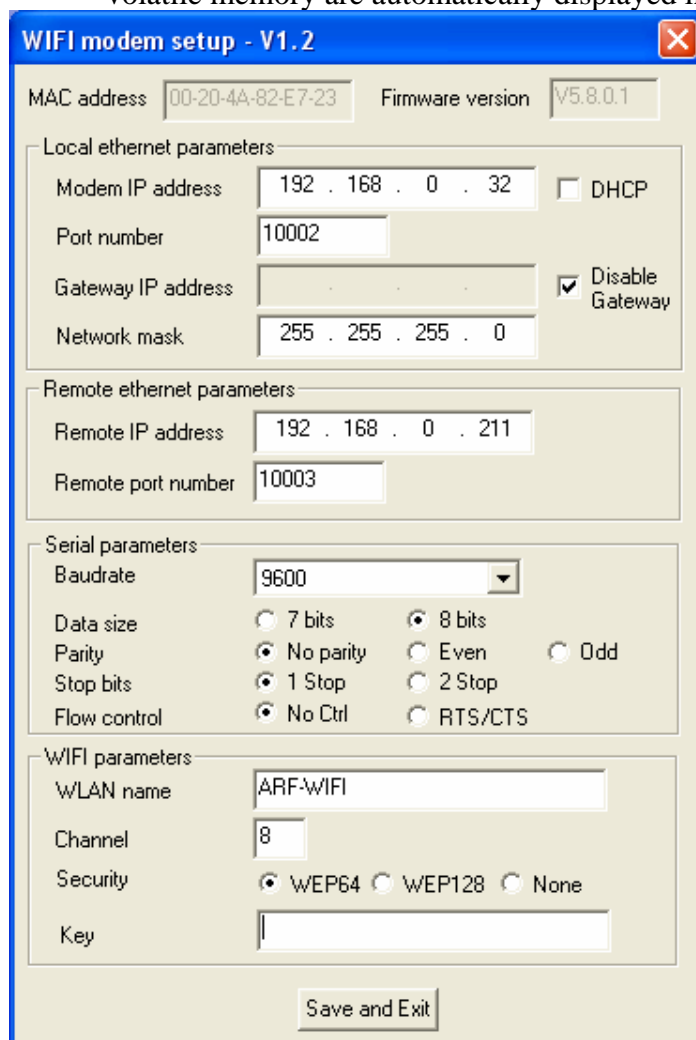
- By default, the set-up software operates on COM1. The configuration of parameters is automatic to be able to communicate with the WIFI modem set-up. The COM port can be changed by selecting the COM set-up button:



- Once one of the COM ports has been selected, the Select Port button can be pressed. The software comes back on the last dialog:



- To start configuring, the following procedure must be applied: Switch off the modem (if powered), then switch on and immediately after that, press the OK button. The parameter dialog must appear (in case of error, the software displays an error message and the procedure must be retried). The WIFI modem parameters stored in the non-volatile memory are automatically displayed in the dialog.



“*Save and Exit*” button allows the storage in the modem non-volatile memory. The parameters are preserved even if the modem is powered off, the set-up mode is exited and transparent mode is entered (see the delay to respect before starting with the modem in the **Erreur ! Source du renvoi introuvable.** chapter). **Please note that the key register field is left blank after**

- **dialog update. The field must be filled before using the “Write” button if WEP security 64 or 128 bits is configured.**
- If set-up application is left using the closing cross, the set-up mode is exited without saving the parameters in the non-volatile memory. New parameters are not applied.

Configuration with telnet port

- After selection of telnet set-up, the parameters dialog appears on the screen. The dialog displays the list of modems found on the LAN.

WIFI modem setup - V1.2

WIFI modem detected

MAC address 00-20-4A-82-E7-23 Firmware version V5.8.0.1

00-20-4A-82-E7-21 / 192.168.0.30
00-20-4A-82-E7-23 / 192.168.0.32

Local ethernet parameters

Modem IP address 192 . 168 . 0 . 32 DHCP

Port number 10002

Gateway IP address Disable Gateway

Network mask 255 . 255 . 255 . 0

Remote ethernet parameters

Remote IP address 192 . 168 . 0 . 211

Remote port number 10003

Serial parameters

Baudrate 9600

Data size 7 bits 8 bits

Parity No parity Even Odd

Stop bits 1 Stop 2 Stop

Flow control No Ctrl RTS/CTS

WIFI parameters

WLAN name ARF-WIFI

Channel 8

Security WEP64 WEP128 None

Key

Find Modems Save

- “*Find Modems*” button browses the network searching for ARF42 WIFI modems. The IP address and the MAC address of each modem found are displayed in the modem list to easily identify modems in a DHCP network configuration. To get a successful result, WIFI modem must be installed in the same subnet as the “WIFI modem set-up” application.
- “*Save*” button performs the save operation of parameters in the non-volatile memory of the selected modem. After that, the software disconnects from the selected modem: the parameter fields are blanked and the modem is unselected in the list.
- On user selection from the list on the left side of the windows, parameters of the selected modem are displayed on the right of the panel. Any modem can be selected to show its parameters. **Note that the list reflects the modems found on the LAN at software entry or after the Find Modems button has been pressed to update the**

list. The list does not match modems that would have been disconnected from the LAN or which have changed their configuration or that would have get another IP address in DHCP mode. The selection of a modem that would be no more reachable will terminate with an error message.

- When a modem is selected (user selection from the modem list) or configured (save button pressed), a delay of about 10 seconds may be necessary to re-access the same modem. This is due to the internal reboot time of the modem unit. During this time, the modem may not be visible in the list if "Find modem" is pressed, or its parameters may not be refreshed if it is selected.
- Exiting the application will exit from the modem set-up of the currently selected modem. The parameters are not saved. Parameters are only saved in the modem by using the Save button.

- **Configuring modem parameters**

DHCP Device name:

If modem has to get its IP address from a BOOTP or DHCP server, the DHCP check box has to be checked. In this case, the DHCP discover frame includes the device name specified in this edit box. If no name is specified here (blank field), the device name is set to Cxxxxxxxx where xxxxxxxx are the 8 last bytes of the MAC address of the modem coded in ASCII format.

Modem IP address:

If modem is used on a network using fixed IP address, the IP address of the module is specified in this edit box.

Port Number:

The port number setting is used in TCP connection. It is the channel for connection initiated by a remote client.

- Packets sent to the modem with this port number are received on this channel.
- The port number setting is used as source port number for outgoing packets.

Gateway IP address:

The gateway address setting (router address) allows communication to other LAN segments. The

gateway address should be the IP address of the router connected to the same LAN segment as the modem. The gateway address must be within the local network.

Network Mask:

The net mask defines the number of bits taken from the IP address that are assigned for the host part. The net mask is entered under IP address format (decimal values).

Remote IP address:

The remote IP address is the destination address used to perform an outgoing connection.

Remote Port Number:

The remote TCP port number is used in TCP connections. It is the port number used for modem initiated connections to make outgoing connections. This parameter defines the port number on the target host to which a connection is attempted.

Baudrate:

The baud rate setting defines the speed used by the modem to communicate on its serial link during data transfers. This setting is not applicable for the modem configuration mode.

Data size:

Data size setting defines the number of data bits used by the modem to communicate on its serial link during data transfers. This setting is not applicable for the modem configuration mode.

Parity:

Parity setting defines the kind of parity used by the modem to communicate on its serial link during data transfers. This setting is not applicable for the modem configuration mode.

Stop bits:

Stop setting defines the number of bits used by the modem to communicate on its serial link during data transfers. This setting is not applicable for the modem configuration mode.

Flow control:

Flow control setting defines if RTS/CTS hardware control is used or not by the modem to communicate on its serial link during data transfers. This setting is not applicable for the modem configuration mode.

WLAN name:

The WLAN name is the name of the WIFI network in which the modem resides.

Channel:

The channel number used when connecting in ad hoc mode. By default, the modem try to connect to an access point using the WLAN name. If this connection fails, the modem uses the WLAN name and the channel number to connect to another modem using the WIFI ad hoc mode.

Security:

This setting defines the kind of security (WEP64 or WEP128 or no security) used on WIFI network.

Key:

The key parameter is used as encryption key when WEP64 or WEP128 is selected. It is not used for authentication (the WIFI modem only uses “Open system” authentication). The key parameter will never be displayed in the dialog and must be re-entered each time the parameters are written in the modem. The key is 10 digits for WEP64 and 26 digits for WEP128.

- **Important note**

During all the configuration process until the set-up software application is closed, the modem must not be powered off. In such a case, the software must be exited and the procedure must be replayed from the beginning.

SPECIFICATIONS

RF

- Frequency range : 2.412 – 2.484 GHz
- Radiated RF power : + 15 dBm
- Sensitivity : –82 dBm
- Range : 200 m in free field
- Standards compliance : EN 300-328

WIFI

- Network standard : 802.11b
- Modulation : DSSS
- Security : WEP 64, WEP 128
- Radio data rate : Up to 11 Mbps
- Supported LAN Protocols : TCP-IP, DHCP, BOOTP, ICMP

Modem interface

- Serial data rate : From 2.4 to 921.6 Kbps
- Serial ports : Tx/D, Rx/D.
- Flow control : RTS, CTS
- Set-up and configuration : Through set-up software (by serial link or telnet)
- Modes : Transparent

Set-up software

- Operating System : Windows 2000, Windows XP
- Screen resolution : 800x600 min

General information

- Power supply : 8 to 30 Volts (integrated regulator)
- Typical consumption : 313 mA at 230 kbps / 374 mA at 922 kbps
- Max Consumption : 432 mA
- Operating temperature : -20 to +70 °C
- Size : 145x100x40 mm
- Packaging : IP65 box with integrated antenna

References

- ARF42 : ARF7255B - IP65 box version