WLAN READER

USER MANUAL

for

PUR-MR-250W

PUR-MR-500W

PUR-SR-500W

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1 Configuring the WLAN Interface

1.1 Introduction

The PUR-SR and PUR-MR are reader with a WLAN interface for communication. Since WLAN is not plug & play and always needs a configuration, the readers offer an interface to configure the WLAN interface using USB. To do this there must be a rough understanding of the architecture of the device.

There are two components in the readers:
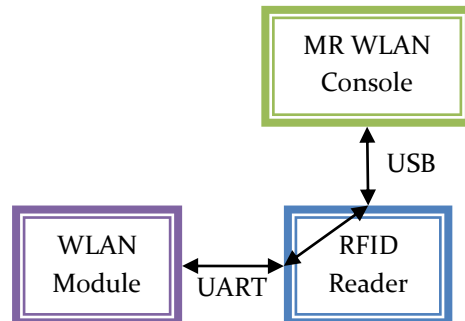- WLAN Module
- RFID Reader

Usually the WLAN Module communicates direct with RFID-Reader and just passes the data, which it gets form the WLAN interface to the RFID Reader and vice versa. This is the standard operating mode, where the RFID Reader can be controlled using the Reader-Host-Protocol.
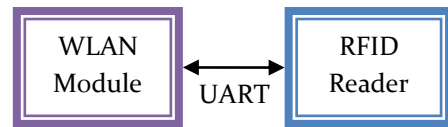
To configure the WLAN Module, there are two ways. One way is to configure it using the UART interface of the WLAN Module, the other way is to configure it using the connected WLAN interface. Sind the second possibility, using the WLAN interface, is very dangerous, because if there happens any error while the configuration the WLAN Module can perhaps not be connected any more, the first possibility using UART is much more safe.

To do this, the reader was extended with a special mode so it can bypass special commands from USB to UART. Therefore a extra software was created to activate this special mode and to send commands to the WLAN Module. This software is called "MR WLAN console".
In this mode the reader bypasses the complete communication from UART to USB and vice versa. So there can be no communication with the reader using the Reader-Host-Protocol.

1.2 WLAN Module

The used WLAN Module is the WiFly GSX from the company Roving Networks. For any further configuration the User Manual for the module is required. This can be directly downloaded from the homepage of the company.
Link: http://www.rovingnetworks.com/files/resources/WiFly-RN-UM.pdf

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1.3 WLAN Console

The WLAN Console is a very simple tool to communicate with the WLAN Module. It offers the possibility to

- Send a command to the WLAN Module
- Send a batch file with commands to the WLAN module
- Reset the WLAN Module to factory settings
- Switch the WLAN Module to an initial AdHoc Mode
- Switch the Reader to the Bootloader without using WLAN
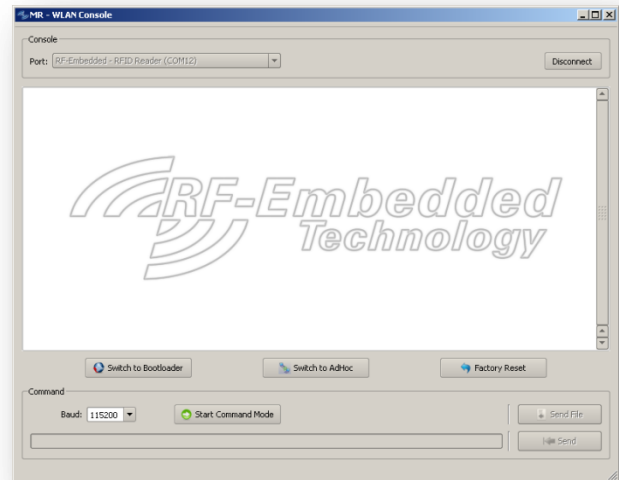
At first the reader must be connected to the WLAN Console. So the first step is to connect the reader via USB to the PC. The driver for the USB interface is either installed with the Reader Suite or with the WLAN Console. The USB driver is the same like for all other RF-Embedded USB readers. If the device is connected to the PC, the WLAN Console must be started. In the upper part of the application, the COM port of the reader must be selected. After this the reader can be opened by pressing the "Connect" button.
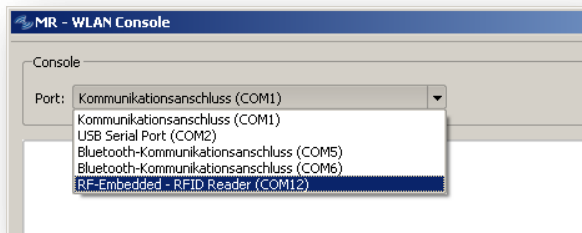
1.3.1 Static Commands

In this mode, when the reader is only connected, the application can be used to send some commands to the reader. These commands are:

- **Switch to Bootloader**
  The reader is switched to the bootloader, which only works via USB. This command can be used to update the reader even if there is a problem with the firmware or the WLAN interface.

- **Switch to AdHoc**
  By sending this command, the WLAN Module is configured in a default AdHoc mode. The parameters are:

SSID:	WiFly-GSX-XX, where XX is the final two bytes of the devices MAC address
Channel:	1
DHCP:	OFF
IP address:	169.254.1.1
Netmask:	255.255.0.0

  Caution: This setting is not persistant.

- **Factory Settings**
  This command rests all settings of the WLAN Module to the factory settings.

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1.3.2 Command Mode

To enter the command to configure the WLAN Module, the Start Command Mode button must be pressed.

> **CAUTION!**   If the command mode is activated, the reader cannot be controlled via WLAN because every Reader-Host-Protocol command is bypassed to USB.

To successfully start the command mode, a valid baud rate must be configured. The configured baud rate is the baud rate with which the RFID Reader communicates with the WLAN Module. By default the baud rate is 115200 baud, which is the baud rate that is used by the RFID Reader to communicate in the normal mode.

> **CAUTION!**   After a factory reset the baud rate is set to 9600 baud. Since the reader communicates in normal mode with a baud rate of 115200 baud the reader will not communicate via WLAN.
> After a factory reset the baud rate of the WLAN module must be set to 115200 baud:
> **`set uart baud 115200`**

So if the right baud rate was selected and the command mode could be started, the WLAN Module can be configured using the syntax of the WiFly GSX User Manual.

The easiest way to test the command mode is to enter the command:

> **`get everything`**

If the command mode is working every setting will be returned.

Example – Infrastructure

This example shows how to configure the module to join an unencrypted WLAN access point:

> **`set ip dhcp 1`**
> > Enables the module to use DHCP
>
> **`set wlan auth 0`**
> > Sets the WLAN authentication mode to "Open"
>
> **`set wlan channel 0`**
> > Sets the WLAN channel to be scanned
>
> **`set wlan join 1`**
> > Sets the policy for automatically joining networks to:
> > > *"Try to join the access point that matches the stored SSID, passkey and channel. Channel can be set to 0 for scanning. (Default)"*
>
> **`set wlan ssid RF-Embedded$WLAN`**
> > Sets the WLAN SSID to "RF-Embedded WLAN"
>
> **`save`**
> > Saves the settings permanent
>
> **`reboot`**
> > Reboots the WLAN Module

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Example – AdHoc

This example shows how to configure the module to create an unencrypted AdHoc network :

set ip dhcp 0
> Disables the module to use DHCP

set ip address 192.168.1.100
> Sets the IP to 192.168.1.100

set ip netmask 255.255.255.0
> Sets the subnet mask to 255.255.255.0

set wlan auth 0
> Sets the WLAN authentication mode to "Open"

set wlan channel 11
> Sets the WLAN channel to the channel 11

set wlan join 4
> Sets the policy for automatically joining networks to:
>> *"Create an Adhoc network, using stored SSID, IP address and netmask. Channel MUST be set. DHCP should be 0 (static IP) or set to Auto-IP with this policy. (unless another Adhoc device can act as DHCP server)"*

set wlan ssid RF-Embedded$WLAN
> Sets the WLAN SSID to "RF-Embedded WLAN"

save
> Saves the settings permanent

reboot
> Reboots the WLAN Module

These lists of commands can also be stored in batch file and can be loaded with the application. The application then tries to send every line that is in the file to the WLAN Module.

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2 Configuring the OS

2.1 Ad-Hoc

The following chapters show you how to connect the reader with your PC or Mac.
The reader comes with these default settings:

WLAN:	Ad-Hoc
SSID (MR):	RF-Embedded MR WLAN
SSID (SR):	RF-Embedded SR WLAN
IP:	192.168.1.100 / 255.255.255.0
Port:	2000

2.1.1 Mac (Lion)

If the device is configured to create an Ad-Hoc network and the device is switched on, the new Ad-Hoc WLAN should appear in the list of available WLAN networks. To connect to this network, just select the entry in list.

As default most OS are set to use a DHCP-Server in a WLAN to get an IP. Since there is no DHCP-Server in the Ad-Hoc WLAN, the OS will not get any response on its requests and will fall back to an IP that usually looks like this: 169.254.XXX.XXX.

This IP is not in the IP-subnet of the PUR-MR-250W, thus the IP of the WLAN-adapter must be changed. Therefore the system preferences must be opened.

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On the first view one can see that the Wi-Fi/AirPort adapter is connected to the desired network but has a self assigned IP. This must be changed to one that is in the subnet of the PUR-MR-250W.

To change this, it is necessary to open the advanced settings with the button at bottom right.

In the TCP/IP tab the IP settings can be changed. By default the IPv4 configuration is set to DHCP. This must be changed to "Manual" configuration. If this is done, the IP can be entered. To communicate with the reader the following settings can be configured:

IP: 192.168.1.101
Subnet: 255.255.255.0
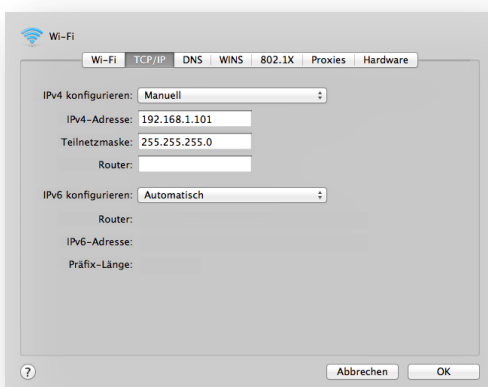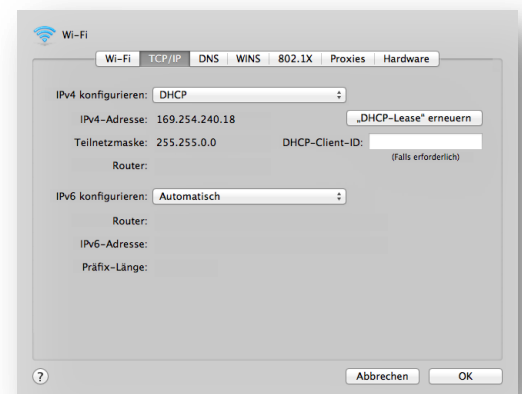
After the change the TCP/IP settings should look like this:

This can now be acknowledged by pressing "OK".

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After the settings are changed, the changes must be accepted by pressing the Accept button at bottom right.

If this is done, the Wi-Fi/AirPort will show "Connected" as status.

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3 Connecting with Reader Suite

Now the reader can be connected with the Reader Suite. This is done by entering the IP and the port of the reader.

IP: 192.168.1.100

Port: 2000

By pressing "OK" the Reader Suite tries to connect the reader. If everything was configured right, the reader will appear in the Reader Suite main window: