WIRELESS LAN

Copyright © April 13, 2005 Funkwerk Enterprise Communications GmbH

Bintec User's Guide - X2250

Version 0.9

Purpose

This document is part of the user's guide to the installation and configuration of Bintec gateways running software release 7.1.16 or later. For up-to-the-minute information and instructions concerning the latest software release, you should always read our **Release Notes**, especially when carrying out a software update to a later release level. The latest **Release Notes** can be found at www.funkwerk-ec.com.

Liability

While every effort has been made to ensure the accuracy of all information in this manual, Funkwerk Enterprise Communications GmbH cannot assume liability to any party for any loss or damage caused by errors or omissions or by statements of any kind in this document and is only liable within the scope of its terms of sale and delivery.

The information in this manual is subject to change without notice. Additional information, changes and **Release Notes** for Bintec gateways can be found at www.funkwerk-ec.com.

As multiprotocol gateways, Bintec gateways set up WAN connections in accordance with the system configuration. To prevent unintentional charges accumulating, the operation of the product should be carefully monitored. Funkwerk Enterprise Communications GmbH accepts no liability for loss of data, unintentional connection costs and damages resulting from unsupervised operation of the product.

Trademarks

Bintec and the Bintec logo are registered trademarks of Funkwerk Enterprise Communications GmbH.

Other product names and trademarks mentioned are usually the property of the respective companies and manufacturers.

Copyright

All rights are reserved. No part of this publication may be reproduced or transmitted in any form or by any means – graphic, electronic, or mechanical – including photocopying, recording in any medium, taping, or storage in information retrieval systems, without the prior written permission of Funkwerk Enterprise Communications GmbH. Adaptation and especially translation of the document is inadmissible without the prior consent of Funkwerk Enterprise Communications GmbH.

Guidelines and standards

Bintec gateways comply with the following guidelines and standards:

R&TTE Directive 1999/5/EG

CE marking for all EU countries and Switzerland

You will find detailed information in the Declarations of Conformity at www.funkwerk-ec.com.

How to reach Funkwerk Enterprise Communications GmbH

Funkwerk Enterprise Communications GmbH
Suedwestpark 94
D-90449 Nuremberg
Germany

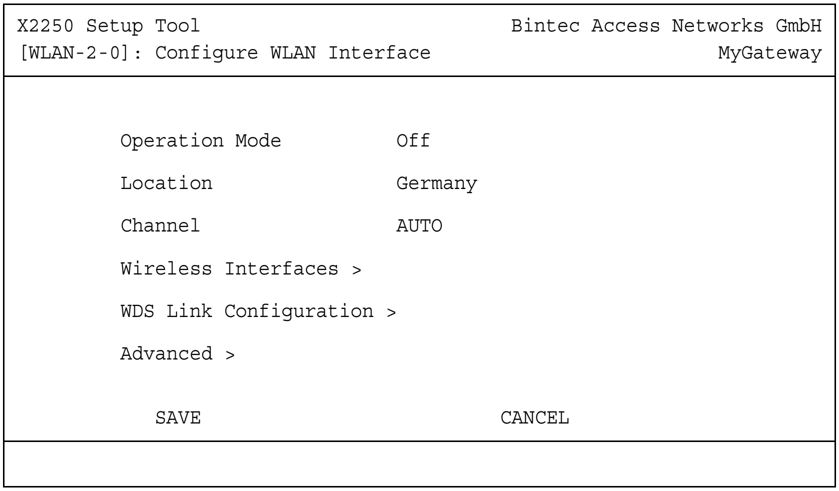
Telephone: +49 180 300 9191 0
Fax: +49 180 300 9193 0
Internet: www.funkwerk-ec.com

Bintec France
6/8 Avenue de la Grande Lande
F-33174 Gradignan
France

Telephone: +33 5 57 35 63 00
Fax: +33 5 56 89 14 05
Internet: www.bintec.fr

1 Wireless LAN Menu

The fields of the *WIRELESS LAN* menu are described below.



```
X2250 Setup Tool                                 Bintec Access Networks GmbH
[WLAN-2-0]: Configure WLAN Interface                               MyGateway


          Operation Mode          Off

          Location                Germany

          Channel                 AUTO

          Wireless Interfaces >

          WDS Link Configuration >

          Advanced >


             SAVE                         CANCEL
```

The ***WIRELESS LAN*** menu contains the general settings for the configuration of the gateway as an access point (AP).

The menu consists of the following fields:

Field	Description
Operation Mode	The operation mode of the gateway. Possible values: - *Off* (default value): gateway does not operate as AP - *Access Point*: enable gateway operating as access point MSSID (Multi SSID)

Field	Description
Location	The country setting of the AP. Possible values are all countries preconfigured on the wireless module of the gateway. The channel list entries differ according to the country setting selected.
Channel	The channel used by the AP. Possible values: ■ *AUTO* (default value) ■ *1 ... 13*

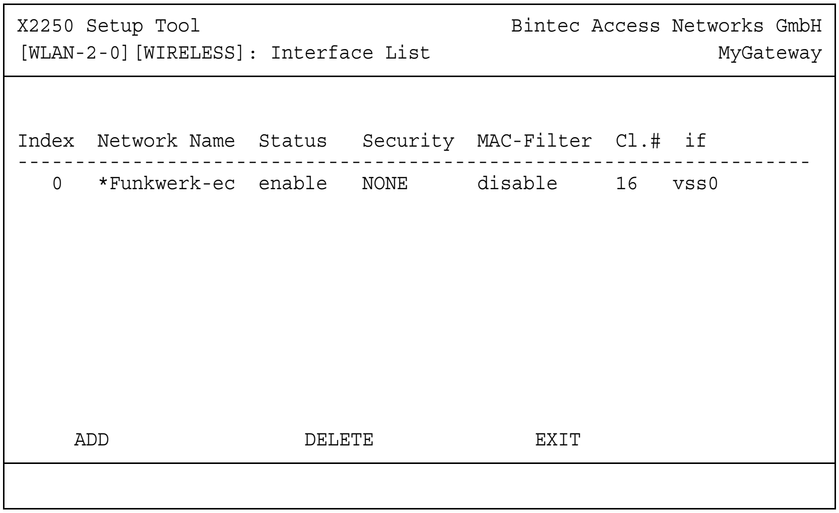
Table 1-1: ***WIRELESS LAN*** menu fields

The menu provides access to the following submenus:

- ***WIRELESS INTERFACES***
- ***WDS LINK CONFIGURATION***
- ***ADVANCED***

2 Wireless Interfaces Submenu

The fields of the *WIRELESS INTERACES* menu are described below.



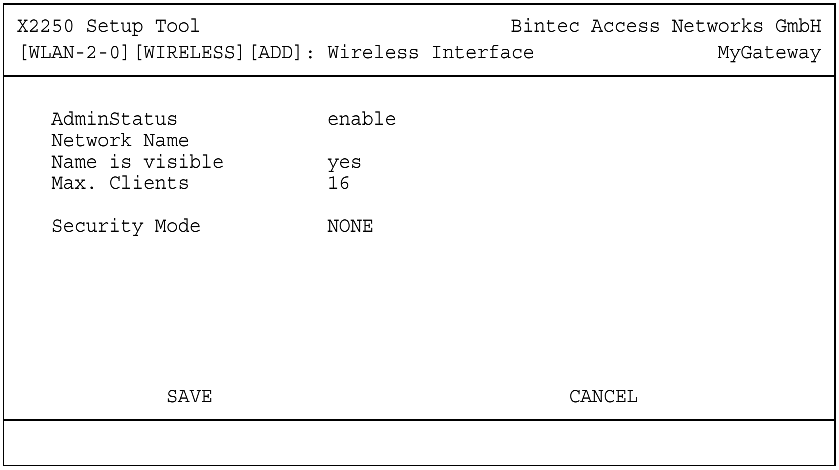
```
X2250 Setup Tool                                  Bintec Access Networks GmbH
[WLAN-2-0][WIRELESS]: Interface List                                MyGateway


Index  Network Name  Status   Security  MAC-Filter  Cl.#  if
----------------------------------------------------------------------
   0   *Funkwerk-ec  enable   NONE      disable     16   vss0










     ADD                    DELETE                 EXIT
```

The ***WIRELESS LAN*** ➜ ***WIRELESS INTERFACES*** submenu displays a list with already configured wireless interfaces and contains essential properties such as network name, status etc. The '*' in front of the network name (SSID) means that the network name is visible on active probing.

Each wireless interface (with prefix *vss*) has its own IP settings and can use all standard interface specific features such as QoS, Stateful Inspection, Accounting etc. This opens a wide range of applications for the WLAN gateway.

The Bintec WLAN gateway not only offers bridging for wireless connections, but is also fully integrated into the routing environment.

The configuration of the wireless interfaces is carried out in ***WIRELESS LAN*** ➜ ***WIRELESS INTERFACES*** ➜ **ADD/EDIT** (screenshot displays the **ADD** menu):



```
X2250 Setup Tool                              Bintec Access Networks GmbH
[WLAN-2-0][WIRELESS][ADD]: Wireless Interface                  MyGateway

   AdminStatus              enable
   Network Name
   Name is visible          yes
   Max. Clients             16

   Security Mode            NONE




              SAVE                                  CANCEL
```

The menu consists of the following fields:

Field	Description
AdminStatus	Administrative status of the wireless interface. Possible values: ■ *enable* (default value): enable the interface ■ *disable*: disable the interface
Network Name	Name of the wireless interface (SSID). Enter an ASCII string of max. 32 characters.
Name is visible	Enable broadcasting of the network name (SSID) of the wireless interface. Possible values: ■ *yes* (default value): network name is visible for clients within reach ■ *no*: network name is hidden

Field	Description
Max. Clients	Maximum number of client connections allowed. Possible values: *1* ... *48*. Default value is *16*.
Security Mode	The security mode of the wireless interface. Possible values: ■ *NONE* (default value): no security mode ■ *WEP 40/64*: WEP 40Bit ■ *WEP 104/128*: WEP 104Bit ■ *WPA PSK (TKIP)*: WPA Preshared Key ■ *WPA (TKIP + 802.1x)*: 802.11i/TKIP ■ *WPA2 (CCMP + 802.1x)*: 802.11i/CCMP If ***SECURITY MODE*** is set to *WPA (TKIP + 802.1x)* or *WPA2 (CCMP + 802.1x)*, the following note is displayed: *A Radius Server configuration in RADIUS setup is required.*
Default Key	Only for ***SECURITY MODE*** = *WEP 40/64, WEP 104/128* Here you select one of the configured keys in ***KEY <1 - 4>*** to be the one used as default.

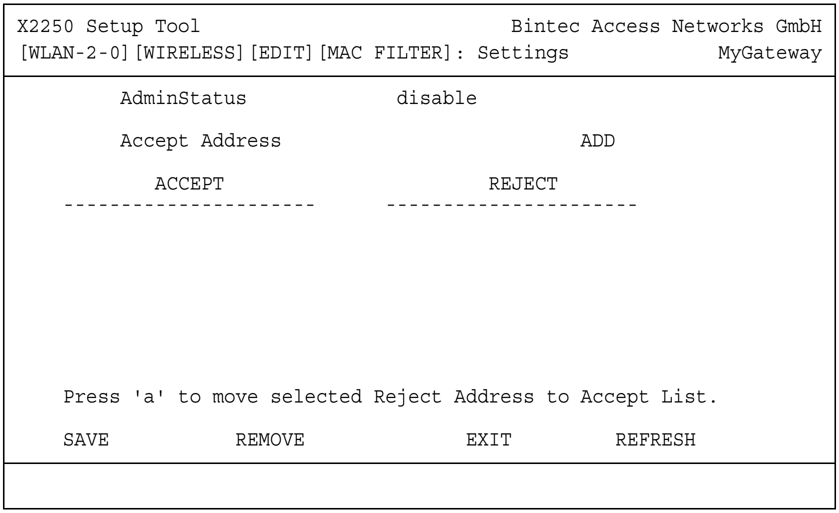
Field	Description
Key <1 - 4>	Only for ***Security Mode*** = *WEP 40/64, WEP 104/128* Here you enter the WEP key. WEP keys can be entered in three different ways: ■ Automatic key generation (recommenced): Entering any phrase not starting with *0x* or " generates a MD5 based WEP phrase with the exact count of digits for the current WEP mode. ■ Direct Hex Digit Input Starting the key with *0x*, disables the generator. Enter the key with the exact count of hexdigits for the selected WEP mode. 10 digits for WEP40 or 26 digits for WEP104. e.g. WEP40: *0xA0B23574C5* , WEP104: *0x81DC9BDB52D04DC20036DBD831* ■ Direct ASCII based input Starting the key with ", disables the generator. Enter a string with the exact count of characters for the selected WEP mode. The phrase ends with ". For WEP40 the phrase must have 5 characters, for WEP104 13 characters. e.g. "*hallo*" for WEP40 "*funkwerk-wep1*" for WEP104.
Preshared Key	Only for ***Security Mode*** = *WPA PSK (TKIP)* Here you enter the WPA passphrase. Enter an ASCII String of 8 - 32 characters.

Table 2-1: ***Wireless Interfaces*** menu fields

The following submenus are only displayed on editing an existing wireless interface.

2.1 MAC Filter Submenu

The fields of the *MAC FILTER* submenu are described below.



```
X2250 Setup Tool                           Bintec Access Networks GmbH
[WLAN-2-0][WIRELESS][EDIT][MAC FILTER]: Settings              MyGateway

         AdminStatus             disable

         Accept Address                          ADD

            ACCEPT                        REJECT
    ----------------------      ----------------------






    Press 'a' to move selected Reject Address to Accept List.

    SAVE           REMOVE              EXIT         REFRESH

```

In the ***WIRELESS LAN*** ➜ ***WIRELESS INTERFACES*** ➜ ***ADD/EDIT*** ➜ ***MAC FILTER*** submenu, hardware specific acces control is configured. Thus it is possible to allow only specific clients to access the AP. This filter is checked before any other security mechanism is activated. The entered addresses are MAC based and are configured separately for each wireless interface.

MAC Address Lists

The ***ACCEPT*** list displays all MAC addresses to be accepted for the current wireless interface.

The ***REJECT*** list displays all rejected addresses or adresses assigned to another interface but not accepted by this interface.

Additional buttons

The **REFRESH** button reloads the ***REJECT*** list, so that at any time the current status of rejects can be listed.

With the **REMOVE** button selected addresses can be deleted from the ***ACCEPT*** list. Removing an address from the ***ACCEPT*** list immediately disconnects an established link.

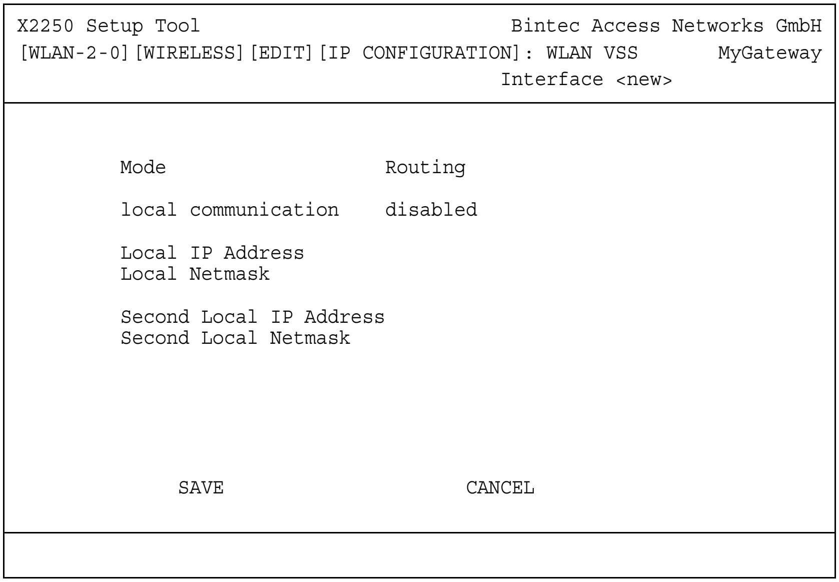
The menu consists of the following fields:

Field	Description
AdminStatus	Enable or disable the filter for this wireless interface. Possible values: *enable*, *disable* (default value)
Accept Address	Enter a MAC address to be accepted. Possible values: 12 digit MAC addresses; the addresses are entered without any ":". Press **ADD** to add the entered MAC address to the ***ACCEPT*** list. If you highlight an entry from the ***REJECT*** list and press **a** (must be lowercase) on your keyboard, the respective entry is moved to the ***ACCEPT*** list. Thus you do not have to manually enter acceptable addresses.

Table 2-2: ***MAC FILTER*** menu fields

2.2 IP and Bridging Submenu

The fields of the *IP AND BRIDGING* submenu are described below.



```
X2250 Setup Tool                              Bintec Access Networks GmbH
[WLAN-2-0][WIRELESS][EDIT][IP CONFIGURATION]: WLAN VSS       MyGateway
                                             Interface <new>


         Mode                       Routing

         local communication        disabled

         Local IP Address
         Local Netmask

         Second Local IP Address
         Second Local Netmask





              SAVE                           CANCEL

```

In the ***Wireless LAN*** ➜ ***Wireless Interfaces*** ➜ ***ADD/EDIT*** ➜ ***IP and Bridging*** submenu you enter the interface specific IP configuration.

The menu consists of the following fields:

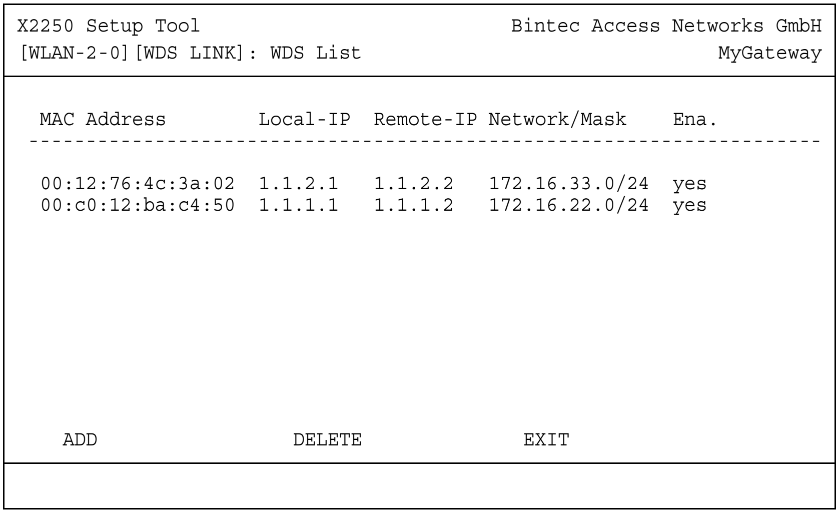
Field	Description
Mode	Defines the mode of the wireless interface. Possible values: ■ *Routing* (default value): Routing is enabled on the wireless interface. ■ *Bridging*: Bridging is enabled on the wireless interface.
local communication	Allows the communication between the clients connected to this wireless interface. Possible values: *enabled*, *disabled* (default value)

Field	Description
Local IP Address	Only for ***WORKING MODE*** = *Routing* Here you assign an IP address to the wireless interface.
Local Netmask	Only for ***WORKING MODE*** = *Routing* Netmask for ***LOCAL IP NUMBER***.
Second Local IP Address	Only for ***WORKING MODE*** = *Routing* Here you assign a second IP address to the wireless interface.
Second Local Netmask	Only for ***WORKING MODE*** = *Routing* Netmask for ***SECOND LOCAL IP NUMBER***.

Table 2-3: ***IP AND BRIDGING*** menu fields

3 WDS Link Configuration Submenu

The fields of the *WDS LINK CONFIGURATION* menu are described below.



```
X2250 Setup Tool                                  Bintec Access Networks GmbH
[WLAN-2-0][WDS LINK]: WDS List                                      MyGateway


  MAC Address        Local-IP  Remote-IP Network/Mask    Ena.
 ---------------------------------------------------------------------

  00:12:76:4c:3a:02  1.1.2.1   1.1.2.2   172.16.33.0/24  yes
  00:c0:12:ba:c4:50  1.1.1.1   1.1.1.2   172.16.22.0/24  yes









    ADD                  DELETE               EXIT
```

The ***WIRELESS LAN*** ➜ ***WDS LINK CONFIGURATION*** menu shows a list of all configured WDS (Wireless Distribution System) Links. WDS links are static links between access points (AP). These links are used in general to connect clients to networks which cannot be reached directly, e.g. because of long distances. The AP receives data from and sends data to another AP serving the network the client participates in.

Attention!

Note that traffic sent between access points in an WDS link is transferred unencrypted. We strongly recommend the use of IPSec to secure traffic in WDS links.

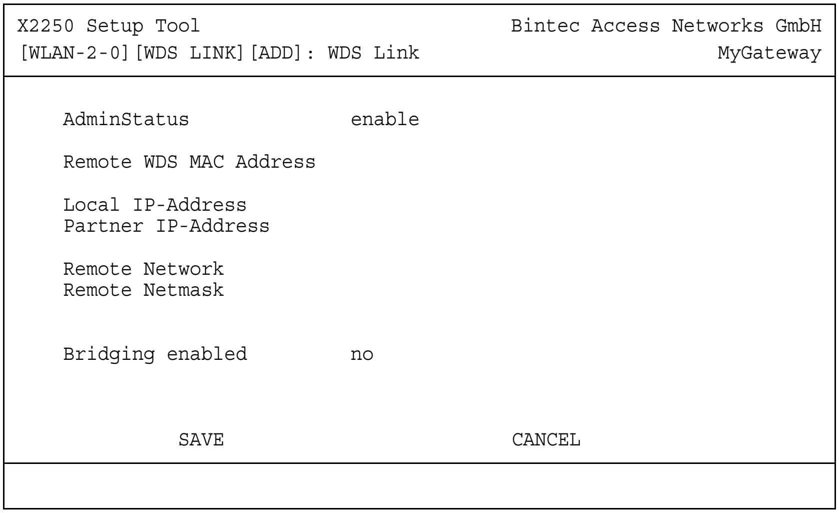
WDS links are configured as interfaces with the prefix *wds*. They operate in the same way as the VSS interfaces, differing, however, by predefined routing. A WDS link is configured as transfer network: it is a point-to-point or a point-to-multipoint connection between two gateways serving different networks.

The list contains the following descriptions

Column	Content
MAC Address	MAC address of the destination WDS link.
Local IP	The IP address of the local interface.
Remote IP	The IP address of the destination WDS interface.
Network/Mask	The network which can be reached via this link, defined by network address and netmask.
Ena.	The link is enabled (*yes*) or not (*no*).

Table 3-1: WDS List

The configuration of the WDS links is carried out in the ***Wireless LAN*** ➜ ***WDS Link Configuration*** ➜ ***ADD/EDIT*** submenu.



```
X2250 Setup Tool                              Bintec Access Networks GmbH
[WLAN-2-0][WDS LINK][ADD]: WDS Link                            MyGateway

    AdminStatus              enable

    Remote WDS MAC Address

    Local IP-Address
    Partner IP-Address

    Remote Network
    Remote Netmask


    Bridging enabled         no



              SAVE                           CANCEL

```

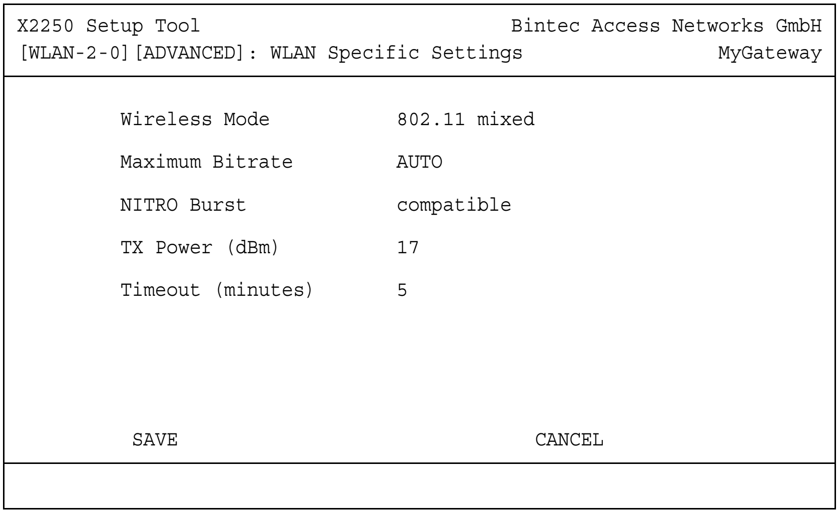
The menu consists of the following fields:

Field	Description
AdminStatus	Status of the link. Possible values: *enable* (default value), *disable*
Remote WDS MAC Address	MAC address of the destination AP.
Local IP-Address	IP address of the local WDS interface.
Partner IP-Address	IP address of the destination WDS interface.
Remote Network	Network connected to the destination interface.
Remote Netmask	Netmask of the destination network.
Bridging enabled	Enable bridging mode for this interface. Possible values: ■ *yes*: enable bridging mode ■ *no* (default value): IP mode only.

Table 3-2: ***WDS Link Configuration*** menu fields

4 Advanced

The fields of the *ADVANCED* menu are described below.



```
X2250 Setup Tool                                Bintec Access Networks GmbH
[WLAN-2-0][ADVANCED]: WLAN Specific Settings                      MyGateway

         Wireless Mode            802.11 mixed

         Maximum Bitrate          AUTO

         NITRO Burst              compatible

         TX Power (dBm)           17

         Timeout (minutes)        5



          SAVE                                 CANCEL
```

In the ***WIRELESS LAN* ➜ *ADVANCED*** menu WLAN specific settings can be modified. Changes, however, are not necessary in general.

The menu consists of the following fields:

Field	Description
Wireless Mode	Operating mode of the AP. Possible values: ■ *802.11g*: 54Mbit Clients only ■ *802.11b*: 11Mbit Mode ■ *802.11 mixed* (default value): 11Mbit and 54Mbit mixed mode ■ *802.11 mixed short:* 11Mbit and 54Mbit mixed mode with short preamble ■ *802.11 mixed long*: 11Mbit and 54Mbit mixed mode with long preamble. This mode is used for Centrino Clients if there are connecting problems.
Maximum Bitrate	The maximum Bitrate from/to a client. Possible values: ■ *AUTO* (default value) ■ *1* up to *54* Mbit
NITRO Burst	This feature increases the maximum burst time for the transmission to a connected station, thus increasing the throughout in slower WLANs. If problems arise with older WLAN hardware, set to *off*. Possible values: *off*, *compatible* (default), *ideal*, *maximum*
TX Power (dBm)	TX output from the AP in dB. Possible values: *1..17* dB Default value is *17*.

Field	Description
Timeout (minutes)	Broken link detection: Here you can set the time after which a client is automatically disconnected if no signal has been received. Possible values: *1..240* Minutes Default value is *5*.

Table 4-1: ***ADVANCED*** menu fields

Index: Wireless LAN