

ETHERNET

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Bintec User's Guide - X2250
Version 1.0

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.

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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.

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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.

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1 Ethernet Menu

The fields of the *ETHERNET* menu are described below. Your **X2250** gateway is equipped with two Ethernet interfaces.

X2250 Setup Tool		Bintec Access Networks GmbH	
[SLOT 0 UNIT 1 ETH]: Configure Ethernet Interface		MyGateway	
IP-Configuration	Manual		
local IP-Number	192.168.0.254		
local Netmask	255.255.255.0		
Second Local IP-Number			
Second Local Netmask			
Encapsulation	Ethernet II		
Mode	Auto		
MAC Address			
Bridging	disabled		
Advanced Settings >			
Virtual Interfaces >			
SAVE		CANCEL	

This chapter contains the settings for the Ethernet interfaces of your gateway. The Ethernet interfaces are the physical interfaces for the connection to the local network or to external networks. You give your gateway the IP address at which it is reached in the LAN resp. WAN in the *ETHERNET* menu. As long as these parameters are not entered in your gateway, it cannot be addressed by other hosts in the network.

If your gateway is connected to an IP network that consists of two subnets, you should enter a **SECOND LOCAL IP NUMBER** and a **SECOND LOCAL NETMASK** for the second subnet.



Note

The same settings are made for interfaces ETH1, ETH2 and where applicable ETH3. ETH1 is preconfigured with **LOCAL IP-NUMBER** 192.168.0.254 and **LOCAL NETMASK** 255.255.255.0.

The **ETHERNET** menu consists of the following fields:

Field	Description
IP-Configuration	<p>Possible values:</p> <ul style="list-style-type: none"> ■ <i>Manual</i>: Default value. IP address and net-mask must be entered (default value). ■ <i>VLAN</i>: Allows the assignment of the Ethernet interface to a >> VLAN. ■ <i>DHCP</i>: Your gateway obtains, among other values, IP address and netmask from a DHCP server.
local IP-Number	IP address of your gateway in the network at the interface.
local Netmask	Netmask of the network in which your gateway with LOCAL IP NUMBER is located.
Second Local IP Number	<p>Only for IP CONFIGURATION Manual or VLAN and after entering a LOCAL IP-NUMBER.</p> <p>Second IP address of your gateway in the network.</p>
Second Local Netmask	<p>Only for IP CONFIGURATION Manual or VLAN.</p> <p>Netmask of the network in which your gateway with SECOND LOCAL IP NUMBER is located.</p>
DHCP MAC Address	<p>Only for IP CONFIGURATION DHCP.</p> <p>MAC address of the corresponding Ethernet interface, e.g. <i>00e1f906bf03</i>.</p> <p>Some providers use hardware-independent MAC addresses to assign their clients IP addresses dynamically. If your provider has assigned you a MAC address, enter this here.</p>
DHCP Hostname	In this field you can enter the host name required by the ISP. The maximum length of the entry is 45 characters.

Field	Description
Encapsulation	<p>Defines the kind of header added to the IP packets that run over this interface. Possible values:</p> <ul style="list-style-type: none"> ■ <i>Ethernet II</i> (conforms to IEEE 802.3, default value) ■ <i>Ethernet SNAP</i> <p>You can generally retain the default value <i>Ethernet II</i>. The interface is called e.g. en0-1 for <i>Ethernet II</i> and en0-1-snap for <i>Ethernet SNAP</i>.</p>
Mode	<p>Defines the mode in which the interface is operated. Possible values:</p> <ul style="list-style-type: none"> ■ <i>Auto</i>: Automatic detection of the operational mode of the Ethernet interface is activated (default value). ■ <i>10 Mbps Half Duplex</i> ■ <i>10 Mbps Full Duplex</i> ■ <i>100 Mbps Half Duplex</i> ■ <i>100 Mbps Full Duplex</i> <p>You should normally leave the default value <i>Auto</i>.</p>
MAC Address	<p>Only for IP CONFIGURATION Manual or VLAN. Here you can assign the interface another MAC address. This is only required for configurations that are more complex than the basic configuration, e.g. <i>00a0f906bf03</i>.</p>
VLAN ID	<p>Only for IP CONFIGURATION VLAN. Here you can assign the Ethernet interface to a VLAN by entering the relevant VLAN ID.</p>

Field	Description
Bridging	Here you can activate BRIDGING for this interface. This function is only necessary for special configurations. Possible values: <i>disabled</i> (default value), <i>enabled</i> .

Table 1-1: **ETHERNET** menu fields

The menu **ETHERNET** leads to further submenus:

- **ADVANCED SETTINGS**
- **VIRTUAL INTERFACES.**

2 Submenu Advanced Settings

The fields of the *ADVANCED SETTINGS* submenu are described below.

X2250 Setup Tool		Bintec Access Networks GmbH	
[SLOT 0 UNIT 1 ETH] [ADVANCED]: Advanced Settings		MyGateway	
RIP Send		none	
RIP Receive		none	
IP Accounting		off	
Proxy ARP		off	
Back Route Verify		off	
SAVE		CANCEL	

The **ETHERNET UNIT → ADVANCED SETTINGS** menu contains settings for the Routing Information Protocol (RIP), IP Accounting, Proxy ARP and "Back Route Verify". The menu is only displayed if a **LOCAL IP-NUMBER** has been configured.

Brief description of routing

The **▶▶ gateway** receives **▶▶ data packets**, each of which contains the destination host IP address. On the basis of the entries in the routing table **IP → ROUTING**, the gateway decides which route to use to forward the data packet to ensure that it arrives at its destination as quickly and cheaply as possible (with the fewest possible intermediate stations). The entries in the routing table can be defined statically or the routing table can be updated constantly by a dynamic exchange of routing information between several gateways. This exchange is controlled by a so-called Routing Protocol, e.g. RIP (Routing Information Protocol).

RIP (Routing Information Protocol)

Gateways use **▶▶ RIP** to exchange information stored in routing tables by communicating with each other at regular intervals to mutually supplement and replace their routing entries. The gateway supports both version 1 and version 2 of RIP, either individually or together.

Gateways can be defined as active or passive gateways: active gateways store routing entries sent by other gateways and offer their routing entries to the oth-

ers via **▶▶ broadcasts**. Passive gateways accept the information from the active gateways and store it, but do not pass on their own routing entries. The gateway provides both variants.

IP accounting This option is for activating or deactivating IP accounting messages for this interface. If IP accounting is activated, accounting messages are generated (and entered in the **biboAdmSyslogTable**), which contain detailed information about the IP-connections of this interface.

Back Route Verification This term conceals a simple but very powerful function of the gateway. If Back-route Verification is activated for an interface, incoming data packets are only accepted over it if outgoing answering packets would be routed over the same interface. You can therefore prevent packets with fake IP addresses being accepted – even without filters.

Proxy ARP The **▶▶ Proxy ARP** function enables the gateway to answer **▶▶ ARP** requests from its own LAN acting for a defined WAN partner. If a host in the LAN wants to set up a connection to another host in the LAN or to a WAN partner but doesn't know its hardware address (MAC address), it sends a so-called ARP request into the network as a **▶▶ broadcast**. If Proxy ARP is activated on the gateway and the desired target host can be reached e.g. over a host route, the gateway answers the ARP request with its own hardware address. This is sufficient for establishing the connection: The **▶▶ data packets** are sent to the gateway, which then forwards them to the desired host.



Note

Ensure that Proxy ARP is also activated at the defined WAN partner.

The configuration is set in the **ETHERNET UNIT → ADVANCED SETTINGS** menus:

Field	Description
RIP Send	Enables RIP packets to be sent via the Ethernet interface. Possible values: see table "Selection options for RIP Send and RIP Receive," on page 10, default value is <i>none</i> .

Field	Description
RIP Receive	For receiving RIP packets via the Ethernet interface. Possible values: see table “Selection options for RIP Send and RIP Receive,” on page 10 , default value is <i>none</i> .
IP Accounting	For generating accounting messages for e.g. ➤➤ TCP- , ➤➤ UDP and ICMP sessions. Possible values: <i>on</i> , <i>off</i> (default value).
Proxy ARP	Enables the gateway to answer ARP requests from its own LAN acting for a defined WAN partner. Possible values: <i>on</i> , <i>off</i> (default value).
Back Route Verify	Activates Backroute Verification for the Ethernet interface. Possible values: <i>on</i> , <i>off</i> (default value).

Table 2-1: **ADVANCED SETTINGS** menu fields

RIP SEND and **RIP RECEIVE** contain the following selection options:

Description	Meaning
none	Not activated.
RIP V2 multicast	Only for RIP SEND For sending RIP V2 messages over the multicast address 224.0.0.9.
RIP V1 triggered	RIP V1 messages are sent resp. received and processed as per RFC 2091. (Triggered ➤➤ RIP).
RIP V2 triggered	RIP V2 messages are sent resp. received and processed as per RFC 2091. (Triggered ➤➤ RIP).
RIP V1	For sending and receiving RIP packets of version 1.

Description	Meaning
RIP V2	For sending and receiving RIP packets of version 2.
RIP V1 + V2	For sending and receiving RIP packets of both version 1 and 2.

Table 2-2: Selection options for **RIP SEND** and **RIP RECEIVE**

3 Submenu Virtual Interfaces

The fields of the **VIRTUAL INTERFACES** submenu are described below.

X2250 Setup Tool		Bintec Access Networks GmbH	
[SLOT 0 UNIT 1 ETH]..[ADD]: Configure Virtual		MyGateway	
LAN Interface # 1			
IP Configuration		Manual	
Local IP Number			
Local Netmask			
Encapsulation		none	
MAC Address		00a0f9	
Advanced Settings >			
SAVE		CANCEL	

The virtual interfaces are shown in the **ETHERNET → VIRTUAL INTERFACES** menu. In the **ETHERNET → VIRTUAL INTERFACES → ADD/EDIT** menu you configure virtual Ethernet interfaces for e.g. redundant networks.

The **VIRTUAL INTERFACES → ADD/EDIT** menu consists of the following fields:

Field	Description
IP-Configuration	Here you select one of four different configuration modes. Possible values: see table "Selection options in IP Configuration," on page 13.
Local IP Number	Here you assign an IP address to the virtual interface.
Local Netmask	Enter the netmask for the LOCAL IP-NUMBER .
Second Local IP Number	Only for IP CONFIGURATION Manual or VLAN and after entering a LOCAL IP-NUMBER . Second IP address of your gateway in the network.

Field	Description
Second Local Netmask	Only for IP CONFIGURATION Manual or VLAN . Netmask of the network in which your gateway with SECOND LOCAL IP NUMBER is located.
Encapsulation	Defines the kind of header added to the IP packets that run over this interface. Possible values: <ul style="list-style-type: none"> ■ <i>Ethernet II</i> (conforms to IEEE 802.3, default value) ■ <i>Ethernet SNAP</i> ■ <i>none</i> <p>You can generally retain the default value <i>Ethernet II</i>. The interface is called e.g. en0-1 for <i>Ethernet II</i> and en0-1-snap for <i>Ethernet SNAP</i>.</p>
MAC Address	Enter the MAC address associated with the virtual interface. You can use the MAC address of the physical interface under which the virtual interface was created, but this is not necessary. You can also assign a virtual MAC address. In VLAN and Manual mode, the first six 6 characters of the MAC address (in BRRP and BRRP over LAN mode the first ten characters) are set as default, but can be changed.
VLAN ID	Is only shown if IP CONFIGURATION is set to VLAN or BRRP over VLAN . Here you assign the virtual interface to a VLAN by assigning the VLAN ID of the respective VLAN. Possible values are 1 (default value) to 4094.

Table 3-1: **VIRTUAL INTERFACES** submenu fields

IP CONFIGURATION contains the following selection options:

Description	Meaning
Manual	This mode permits simple manual IP configuration.
VLAN	The assignment to a VLAN is made via the VLAN ID, which is configured in this mode. A MAC address must be defined in this mode.
BRRP	In this mode the status of the virtual interface is independent of the admin status saved in IFTABLE , but is defined by the tasks in the BRRP Watchdog Daemon. These are configured in the BRRP menu. A MAC address must be defined in the BRRP mode. More information about IP configuration for BRRP can be found in chapter BRRP of the User's Guide.
BRRP over VLAN	In this mode you can configure a BRRP gateway within the possibilities and limits of a virtual LAN.

Table 3-2: Selection options in **IP CONFIGURATION**

3.1 Submenu Advanced Settings

The submenu contains the same option as the **ETHERNET → ADVANCED SETTINGS** menu.

Description see “Submenu Advanced Settings” on page 7.

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