

ETHERNET

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bintec User's Guide - R Series
Version 1.0

Purpose This document is part of the user's guide to the installation and configuration of bintec gateways running software release 7.2.4 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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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* menus are described below.

These menus offer different configuration options depending on the type of device for configuring the interfaces of a switch (***XEY-100SW, FAST ETHERNET***) or for configuring a separate Ethernet interface (***XEY-100BT, FAST ETHERNET***).

You will find a detailed description of your gateway's available interfaces in the User's Guide chapter **Technical Data**.

1 XEY-100SW, Fast Ethernet menu

The fields of the *XEY-100SW*, *FAST ETHERNET* menu for the Ethernet interface with integrated switch are described below.

```
R232bw Setup Tool                Funkwerk Enterprise Communications GmbH
[SWITCH]: Fast Ethernet Configuration                MyGateway

Fast Ethernet/en1-0>

Switch Configuration >

EXIT
```

Your gateway offers the possibility to have the four switch ports operate as one interface (Single Interface Mode) or to operate with a logical separation and individual configuration of the four switch ports (Splitted Ports Mode).

Per default the switch is in single interface mode, i.e. there is just one configuration for all switch ports.

Configuration of the individual ports is carried out in the *FAST ETHERNET/EN1-X* submenu. Configuration of the switch (select Single Interface or Splitted Ports Mode) is carried out in the *SWITCH CONFIGURATION* submenu.

1.1 Fast Ethernet/en1-x Menu

The fields of the *ETHERNET/EN1-X* menu are described below.

R232bw Setup Tool		Funkwerk Enterprise Communications GmbH	
[SWITCH] [SLOT 1 UNIT 0 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	
MAC Address			
Bridging		disabled	
Advanced Settings >			
Virtual Interfaces >			
		SAVE	CANCEL

When separating the switch ports one **FAST ETHERNET/EN1-X** menu is displayed for each splitted port which allows a completely independent configuration of the resulting interfaces. All configuration options are identical to those available for the configuration of a single Ethernet interface (see [“XEY-100BT, Fast Ethernet menu” on page 11](#)).



Note

The Ethernet interface *en1-0* is preconfigured with **LOCAL IP-NUMBER** 192.168.0.254 and **LOCAL NETMASK** 255.255.255.0.

1.2 Switch Configuration Menu

The fields of the SWITCH CONFIGURATION menu are described below.

In this menu you configure, whether to use the Ethernet switch of the gateway in Single Interface Mode (default) or in Splitted Ports Mode.

You can change the switch configuration in the menu **SWITCH CONFIGURATION**:

Switch Port	Assigned Interface	Switch Port Mode
Port 1	en1-0	full autonegotiation
Port 2	en1-0	full autonegotiation
Port 3	en1-0	full autonegotiation
Port 4	en1-0	full autonegotiation
SAVE		CANCEL

The menu contains the following fields:

Field	Description
Switch Port	Here the switch port numbers are displayed. The numbering corresponds to the numbering of the ports on the rear of your gateway.
Assigned Interface	Here you can assign an ethernet interface to the switch port. Four interfaces are available: <i>en1-0</i> to <i>en1-3</i> . The default configuration assigns <i>en1-0</i> to all four switch ports.

Field	Description
Switch Port Mode	<p>Here you choose the mode the interface is to be operated in.</p> <p>Available values are:</p> <ul style="list-style-type: none"> ■ <i>full autonegotiation</i> (default) ■ <i>auto 100 mbps only</i> ■ <i>auto 10 mbps only</i> ■ <i>auto 100 mbps/full duplex</i> ■ <i>auto 100 mbps/half duplex</i> ■ <i>auto 10 mbps/full duplex</i> ■ <i>auto 10 mbps/half duplex</i> ■ <i>fixed 100 mbps/full duplex</i> ■ <i>fixed 100 mbps/half duplex</i> ■ <i>fixed 10 mbps/full duplex</i> ■ <i>fixed 10 mbps/half duplex</i> ■ <i>suspend</i> - The interface is deactivated and disconnected from the power supply. ■ <i>disabled</i> - The interface is created but remains inactive.

Table 1-1: **IP → BANDWIDTH MANAGEMENT (TDRC / LOAD BALANCING / BOD) → TCP DOWNLOAD RATE CONTROL (TDRC) → ADD/EDIT → SELECT TCP SERVICES → ADD**

After switch configuration, the menu **XEY-100SW, FAST ETHERNET** changes and displays the Ethernet interfaces assigned to the switch ports. You can now configure the interfaces individually. The menu offers the same options as for “[XEY-100BT, Fast Ethernet menu](#)” on page 11.

Please note: The separation of the switch ports into Ethernet interfaces is a logical one, i.e. the maximum overall bandwidth available across all switch ports or

Ethernet interfaces remains unchanged (100 Mbit/s Full Duplex). If you, e.g., separate all switch ports, each of the resulting interfaces can use only part of the overall bandwidth.

If you collect several switch ports into a single interface, the bandwidth available between these ports is a full 100 Mbit/s Full Duplex.

1 KEY-100BT, Fast Ethernet menu

The fields of the *KEY-100BT, FAST ETHERNET* menu for the separate Ethernet interface is described below.

R232bw Setup Tool	Funkwerk Enterprise Communication GmbH
[SLOT 5 ETH]: Configure Ethernet Interface	MyGateway
IP-Configuration	Manual
local IP-Number	
local Netmask	
Encapsulation	none
Mode	Auto
MAC Address	
Bridging	disabled
Virtual Interfaces >	
SAVE	CANCEL

This chapter contains the settings for the separate Ethernet interface of your gateway. The Ethernet interface is a physical interface 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 Ethernet interface *en1-0* 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	<p>Only for IP CONFIGURATION DHCP.</p> <p>In this field you can enter the host name required by the provider. The maximum length of the entry is 45 characters.</p>

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) ■ <i>Ethernet SNAP</i> ■ <i>none</i> (default value) <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>100 Mbps Full Duplex</i> ■ <i>Auto</i> (default value) ■ <i>10 Mbps Half Duplex</i> ■ <i>10 Mbps Full Duplex</i> ■ <i>100 Mbps Half Duplex</i>
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.**

1.1 Submenu Advanced Settings

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

R232bw Setup Tool		Funkwerk Enterprise Communication GmbH	
[SLOT 5 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** → **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 **R Series** gateways support 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 others via >> **broadcasts**. Passive gateways accept the information from the active gateways and store it, but do not pass on their own routing entries. The **R Series** gateways provide 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 **R Series** gateways. If Backroute 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 17 , default value is <i>none</i> .
RIP Receive	For receiving RIP packets via the Ethernet interface. Possible values: see table “Selection options for RIP Send and RIP Receive,” on page 17 , default value is <i>none</i> .
IP Accounting	For generating accounting messages for e.g. >> TCP- , >> UDP and ICMP sessions. Possible values: <i>on, 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, off</i> (default value).
Back Route Verify	Activates Backroute Verification for the Ethernet interface. Possible values: <i>on, off</i> (default value).

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

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

Description	Meaning
none	Not activated.

Description	Meaning
RIP V2 multicast	Only for RIP SEND For sending RIP V2 messages over the multi-cast 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.
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 1-3: Selection options for **RIP SEND** and **RIP RECEIVE**

1.2 Submenu Virtual Interfaces

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

R232bw Setup Tool	Funkwerk Enterprise Communication GmbH
[SLOT 5 ETH] [VIRTUAL] [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 20.
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.
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.

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> ■ <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	<p>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.</p> <p>In <i>VLAN</i> and <i>Manual</i> mode, the first six 6 characters of the MAC address (in <i>BRRP</i> and <i>BRRP over LAN</i> mode the first ten characters) are set as default, but can be changed.</p>
VLAN ID	<p>Is only shown if IP CONFIGURATION is set to <i>VLAN</i> or <i>BRRP over VLAN</i>.</p> <p>Here you assign the virtual interface to a VLAN by assigning the VLAN ID of the respective VLAN.</p> <p>Possible values are 1 (default value) to 4094.</p>

Table 1-4: **VIRTUAL INTERFACES** submenu fields

IP CONFIGURATION contains the following selection options:

Description	Meaning
Manual	This mode permits simple manual IP configuration.

Description	Meaning
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.

Table 1-5: Selection options in *IP CONFIGURATION*

1.2.1 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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