

User's Guide
bintec R3000w / R3400 / R3800
Fast Ethernet

Purpose This document is part of the user's guide to the installation and configuration of bintec gateways running software release 7.3.1 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 Fast Ethernet Menu

The fields of the *FAST ETHERNET* menus are described below.

```

R3000w Setup Tool                               Funkwerk Enterprise Communications GmbH
[SWITCH]: Fast Ethernet Configuration           MyGateway

Fast Ethernet/en1-0 >

Fast Ethernet/en1-4 >
Switch Configuration >

EXIT

```

The *FAST ETHERNET* menu provides access to the following submenus:

- ***FAST ETHERNET/EN1-0 >*** bis ***FAST ETHERNET/EN1-3 >***, depending on the configuration of the switch in the ***SWITCH CONFIGURATION*** menu. As per default the four-port-switch operates in Single Interface Mode and is to be configured via the Ethernet interface ***FAST ETHERNET/EN1-0***.
- ***FAST ETHERNET/EN1-4 >***: As per default this Ethernet interface is assigned to the separate Ethernet port ETH5/DMZ.
- ***SWITCH CONFIGURATION:*** For the assignment of the Ethernet interfaces to the available Ethernet ports at your device:
 - the four-port-switch (ETH1 to ETH4)
 - ETH5/DMZ interface.

Split ports 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 (Split Ports Mode).

As per default the switch is in Single Interface Mode, i.e. there is just one configuration for all switch ports.

1 Fast Ethernet/en1-x Menu

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

R3000w 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

The Ethernet port is a physical interface for the connection to the local network or to external networks. You give your gateway the IP addresses at which it is reached in the LAN resp. WAN in the **FAST ETHERNET → FAST ETHERNET/EN1-X** menus. 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.

ETH1 - ETH4 When separating the switch ports (ETH1 - ETH4), each separate port is assigned the required Ethernet interface in the field **ASSIGNED INTERFACE**. For each assigned Ethernet interface one **FAST ETHERNET/EN1-X** menu is displayed in the **FAST ETHERNET** menu, which allows a completely independent configuration of the interfaces.

ETH5/DMZ Assigning a dedicated Ethernet interface is also available for the Ethernet port ETH5/DMZ. As per default this Ethernet port is assigned the Ethernet interface

FAST ETHERNET/EN1-4, the menu of which provides for equal configuration options.



Note

The Ethernet ports of the switch are shipped in Single Interface Mode. The Ethernet interface **FAST ETHERNET/EN1-0** is assigned and is preconfigured with **LOCAL IP-NUMBER 192.168.0.254** and **LOCAL NETMASK 255.255.255.0**.

If you split the ports of the switch in the **SWITCH CONFIGURATION** menu, this pre-configured **LOCAL IP-NUMBER** together with the **LOCAL NETMASK** are assigned to the ETH1 port configured via the **FAST ETHERNET/EN1-0 >** menu.

To be able to reach your device with split ports, insure whilst splitting the ports that the Ethernet interface **FAST ETHERNET/EN1-0** with the preconfigured **LOCAL IP-NUMBER** and **LOCAL NETMASK** is assigned to a port that can be reached via Ethernet. In case of doubt carry out the configuration via a serial connection at the Console interface.

The **FAST ETHERNET/EN1-X** menu consists of the following fields:

Field	Description
IP-Configuration	Possible values: <ul style="list-style-type: none"> ■ <i>Manual</i>: Default value. IP address and netmask 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	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.
DHCP MAC Address	Only for IP CONFIGURATION DHCP . MAC address of the corresponding Ethernet interface, e.g. <i>00e1f906bf03</i> . 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.
DHCP Hostname	Only for IP CONFIGURATION DHCP . In this field you can enter the host name required by the provider. The maximum length of the entry is 45 characters.
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) ■ <i>Ethernet SNAP</i> ■ <i>none</i> (default value) You can generally retain <i>Ethernet II</i> (default value when having entered an IP address in LOCAL IP-NUMBER). The interface is called e.g. en0-1 for <i>Ethernet II</i> and en0-1-snap for <i>Ethernet SNAP</i> .
MAC Address	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> .

Field	Description
VLAN ID	Only for IP CONFIGURATION VLAN . Here you can assign the Ethernet interface to a VLAN by entering the relevant VLAN ID.
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.

R3000w 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 **FAST ETHERNET** → **FAST ETHERNET/EN1-X** → **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 **R3000 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 **R3000 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 **R3000 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 **FAST ETHERNET/EN1-X** → **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 12, 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 12, 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 R3000 Series 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 1-2: **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 multi-cast address 224.0.0.9.
RIP V1 triggered	RIP V1 messages are sent rsp. received and processed as per RFC 2091. (Triggered ►► RIP).
RIP V2 triggered	RIP V2 messages are sent rsp. 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.

Description	Meaning
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.

The virtual interfaces are shown in the *FAST ETHERNET* → *FAST ETHERNET/EN1-X* → *VIRTUAL INTERFACES* menu.

R3000w 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

In the *FAST ETHERNET/EN1-X* → *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 15.
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.
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>

Field	Description
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.
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.

Description	Meaning
BRRP	<p>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.</p> <p>More information about IP configuration for BRRP can be found in chapter BRRP of the User's Guide.</p>
BRRP over VLAN	<p>In this mode you can configure a BRRP gateway within the possibilities and limits of a virtual LAN.</p>

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

1.2.1 Submenu Advanced Settings

The submenu contains the same options as the **FAST ETHERNET → FAST ETHERNET/EN1-X → ADVANCED SETTINGS** menu.

Description see [“Submenu Advanced Settings” on page 8](#).

1 Switch Configuration Menu

The fields of the **SWITCH CONFIGURATION** menu are described below.

In the **FAST ETHERNET → SWITCH CONFIGURATION** menu you configure, whether to use the Ethernet switch of the gateway in Single Interface Mode (default) or in Split Ports Mode.

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

R3000w Setup Tool		Funkwerk Enterprise Communications GmbH
[SWITCH] [ASSIGN]: Switch Interface Assignment		MyGateway
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
Port 5	en1-4	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>en1-4</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: Fields in the **SWITCH CONFIGURATION** menu

After switch configuration, the menu **FAST ETHERNET** changes and displays the Ethernet interfaces assigned to the switch ports. You can now configure the interfaces individually.

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.

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