funkwerk)))
enterprise communications

User's Guide

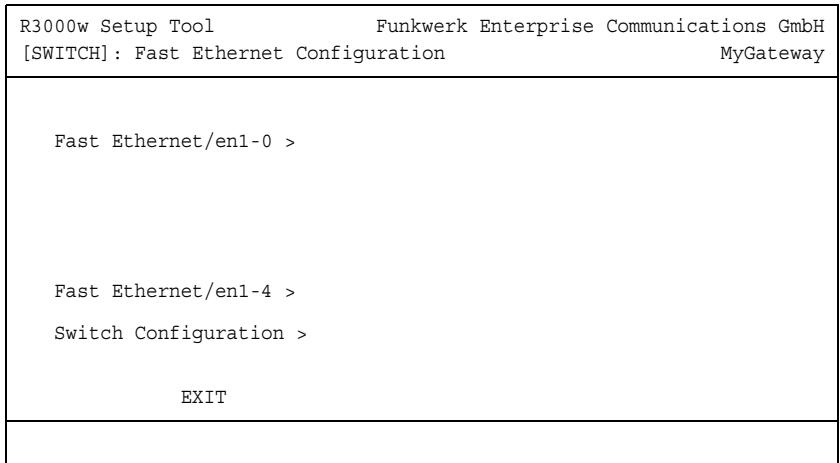**bintec R1200 / R1200w(u) / R3000 / R3000w / R3400 / R3800(wu)**

Fast Ethernet

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 con-
   figuration of the switch in the *SWITCH CONFIGURATION* menu.
   As per default the four ports of the four-port-switch are assigned to the
   Ethernet interface *FAST ETHERNET/EN1-0*.

■ *FAST ETHERNET/EN1-4 >*:
   As per default the port ETH5/DMZ is assigned to the interface
   FAST ETHERNET/EN1-4 >.

■ *SWITCH CONFIGURATION*:
   Here you can assign the ports ETH1 - ETH4 and ETH5/DMZ to any Ether-
   net interface *FAST ETHERNET/EN1-0 >* to *FAST ETHERNET/EN1-4 >*.

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 of the
four switch ports (Split Ports Mode).

2   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 local networks. The assignment of IP adresses to the respective Ethernet interfaces is carried out in the *FAST ETHERNET* ➜ *FAST ETHERNET/EN1-X* menus. Without these parameters, data traffic will be impossible.

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   The switch ports on the gateway are labeled 'ETH1' - 'ETH4'. You can assign these switch ports to the Ethernet interfaces *en1-0* to *en1-4* in the *FAST ETHERNET* ➜ *SWITCH CONFIGURATION* menu.

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 an Ethernet interface *en1-0* to *en1-4* is also available for the port ETH5/DMZ. As per default this port is assigned the Ethernet interface *FAST ETHERNET/EN1-4*.

Note

Ex works all ports of the switch are assigned to the Ethernet interface *FAST ETHERNET/EN1-0*. This interface 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, note that changes during configuration will be immediately effictive after pressing **Save**. A running Telnet session may be interrupted. 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:
	■ *Manual* (default value): *LOCAL IP-NUMBER* and *LOCAL NETMASK* can be entered manually.
	■ *VLAN*: Allows the assignment of the Ethernet interface to a ►► **VLAN** (according to IEEE 802.1q and IEEE 802.3q).
	■ *DHCP*: Your gateway obtains, among other values, *LOCAL IP-NUMBER* and *LOCAL NETMASK* from a DHCP server.
Local IP-Number	IP address of the Ethernet interface.
Local Netmask	Netmask for *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 the Ethernet interface.

Field	Description
Second Local Netmask	Only for **IP CONFIGURATION** *Manual* or *VLAN* and after entering a **LOCAL IP-NUMBER**. Second netmask of the Ethernet interface.
DHCP MAC Address	Only for **IP CONFIGURATION** *DHCP*. MAC address of the corresponding Ethernet interface, e.g. *00e1f906bf03*. Some providers use hardware-independent MAC addresses to assign their clients IP addresses dynamically. If your provider has sent a MAC address to you, enter this here.
DHCP Hostname	Only for **IP CONFIGURATION** *DHCP*. Host name for the DHCP client specified by the provider if necessary. The maximum length of the entry is 45 characters.
Encapsulation	Defines the kind of Ethernet header for this interface. Possible values: ■ *Ethernet II* (conforms to IEEE 802.3) ■ *Ethernet SNAP* ■ *none* (default value) You can generally retain *Ethernet II* (default value when having entered an IP adress in **LOCAL IP-NUMBER**). The interface is called e.g. *en1-0* for *Ethernet II* and *en1-0-snap* for *Ethernet SNAP*.
MAC Address	Only for **IP CONFIGURATION** *Manual* or *VLAN*. Here you can assign the interface another MAC address, e.g. *00a0f906bf03*. This is only required for special configurations.

Field	Description
VLAN ID	Only for *IP CONFIGURATION VLAN*.
	Here you can assign the Ethernet interface to a VLAN (according to IEEE 802.1q and IEEE 802.3q) by entering the relevant VLAN ID.
	Possible values are *1* (default value) to *4094*.
Bridging	Here you can activate **BRIDGING** for this interface.
	This function is only necessary for special configurations. Possible values: *disabled* (default value), *enabled*.

Table 2-1:   *FAST ETHERNET/en1-x* menu fields

The menu *FAST ETHERNET/en1-x* leads to further submenus:

■   *ADVANCED SETTINGS*

■   *VIRTUAL INTERFACES*.

2.1   Submenu Advanced Settings

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

```
R3000w Setup Tool            Funkwerk Enterprise Communications GmbH
[SWITCH][SLOT 1 UNIT 0 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. 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.

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 ➤➤ **broadcast**. 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 **biboAdmAcctlogTable**), which contain detailed information about the IP-connections of this interface.

Backroute 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 this interface 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.

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

Note

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 11, default value is *none*.
RIP Receive	For receiving RIP packets via the Ethernet interface. Possible values: see table "Selection options for RIP Send and RIP Receive," on page 11, default value is *none*.
IP Accounting	For generating accounting messages for e.g. ➤➤ **TCP-**, ➤➤ **UDP** and ICMP sessions. Possible values: *on*, *off* (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: *on*, *off* (default value).
Back Route Verify	Activates Backroute Verification for the Ethernet interface. Possible values: *on, off* (default value)*.

Table 2-2: *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 multicast 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.
RIP V1 + V2	For sending and receiving RIP packets of both version 1 and 2, both alternatives are available.

Table 2-3:   Selection options for *RIP SEND* and *RIP RECEIVE*

2.2   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.

In the *FAST ETHERNET/EN1-X* ➜ *VIRTUAL INTERFACES* ➜ *ADD/EDIT* menu you configure virtual Ethernet interfaces for e.g. VLAN or BRRP.

```
R3000w Setup Tool            Funkwerk Enterprise Communications GmbH
[SWITCH][VIRTUAL][ADD]: Configure VirtualLAN Interface # 1    MyGateway


   IP Configuration           Manual
       Local IP Number
       Local Netmask


       Encapsulation             none
  MAC Address                 00a0f9



   Advanced Settings >

          SAVE                                 CANCEL

```

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 14.
Local IP-Number	IP address of the virtual interface.
Local Netmask	Netmask of the virtual interface.
Second Local IP Number	Only after entering a *LOCAL IP-NUMBER*. Second IP address of the virtual interface.
Second Local Netmask	Only for *IP CONFIGURATION Manual* or *VLAN* and after entering a *LOCAL IP-NUMBER*. Netmask for *SECOND LOCAL IP NUMBER*.

Field	Description
Encapsulation	Defines the Ethernet header for this virtual interface. Possible values: ■ *Ethernet II* (conforms to IEEE 802.3, default value) ■ *Ethernet SNAP* ■ *none* (default value) You can generally retain the value *Ethernet II* (default value when having entered an IP adress in **LOCAL IP-NUMBER**). The interface is called e.g. *en1-0-1* for *Ethernet II* and *en1-0-1-snap* for *Ethernet SNAP*.
MAC Address	Enter a MAC address for the virtual interface. In *VLAN* and *Manual* mode, the first six 6 characters of the MAC address are preset to *00a0f9*, in *BRRP* and *BRRP over LAN* mode, the first ten characters are preset to *00005e0001*. In *BRRP* mode, you must add two digits to the preset value. These two digits correspond to the virtual router ID (refer to **BRRP ➜ CONFIGURATION**, e.g. *00005e000101*).
VLAN ID	Only for **IP CONFIGURATION** *VLAN* or *BRRP over VLAN*. Here you assign the virtual interface to a VLAN (according to IEEE 802.1q and IEEE 802.3q) by assigning the VLAN ID of the respective VLAN. Possible values are *1* (default value) to *4094*.

Table 2-4: *VIRTUAL INTERFACES* submenu fields

IP CONFIGURATION contains the following selection options:

Description	Meaning
Manual (default value)	Mode for a simple configuration without VLAN or BRRP.
VLAN	Allows the assignment of a virtual interface to a VLAN. A MAC address must be defined in this mode.
BRRP	Allows the setup of device redundancy by virtual Ethernet interfaces.
	In this mode, the status of the virtual interface depends on the tasks configured in the *BRRP* ➜ *TASK DEFINITION* 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	Corresponds to the settings in BRRP and allows additional assignment of a virtual BRRP interface to a VLAN.

Table 2-5:   Selection options in *IP CONFIGURATION*

2.2.1   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.

3   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.

```
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	Numbering of the Ethernet port. 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. Five interfaces are available: *en1-0* to *en1-4*. *None* deactivates the Ethernet interface. The default configuration assigns port 1 to port 4 to the Ethernet interface *en1-0* and port 5 to the interface *en 1-4*.

Field	Description
Switch Port Mode	Here you choose the operation mode of the switch port. Available values are: ■ *full autonegotiation* (default) ■ *auto 100 mbps only* ■ *auto 10 mbps only* ■ *auto 100 mbps/full duplex* ■ *auto 100 mbps/half duplex* ■ *auto 10 mbps/full duplex* ■ *auto 10 mbps/half duplex* ■ *fixed 100 mbps/full duplex* ■ *fixed 100 mbps/half duplex* ■ *fixed 10 mbps/full duplex* ■ *fixed 10 mbps/half duplex* ■ *suspend* - The switch port is set to a sleep mode (not implemented in the current version; therefore no difference to *disabled*). ■ *disabled* - The port is switched off.

Table 3-1:   Fields in the *SWITCH CONFIGURATION* menu

Depending on switch configuration, the menu *FAST ETHERNET* displays all Ethernet interfaces assigned to the switch ports. Here you can configure each assigned interface 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 assigned Ethernet interfaces is allways the same (100 Mbit/s Full Duplex).

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

Index: Ethernet