funkwerk)))
enterprise communications

User's Guide

bintec R230a / R230aw / R232b / R232bw

Ethernet

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**.

2   XEY-100SW, Fast Ethernet menu

**The fields of the *XEY-100SW, FAST ETHERNET* menu for the Ethernet inter-
face 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 in-
dividual configuration of the four switch ports (Splitted Ports Mode).

Per default the switch is in single interface mode, i.e. there is just one configu-
ration 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.

2.1   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*.

2.2 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*:

```
R232bw 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




                     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: *en1-0* to *en1-3*. The default configuration assigns *en1-0* to all four switch ports.

Field	Description
Switch Port Mode	Here you choose the mode the interface is to be operated in. 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 interface is deactivated and disconnected from the power supply. ■ *disabled* - The interface is created but remains inactive.

Table 2-1: *XEY-100SW, FAST ETHERNET ➜ SWITCH CONFIGURATION*

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 .

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.

3 XEY-100BT, Fast Ethernet menu

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

```
R232bw Setup Tool              Funkwerk Entreprise 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.

Note

Please note that only the gateways **R232b** and **R232bw** are equipped with a separate Ethernet interface.

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	Possible values: ■ *Manual*: Default value. IP address and netmask must be entered (default value). ■ *VLAN*: Allows the assignment of the Ethernet interface to a ►► **VLAN**. ■ *DHCP*: 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.
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
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 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: ■ *Ethernet II* (conforms to IEEE 802.3) ■ *Ethernet SNAP* ■ *none* (default value) You can generally retain the default value *Ethernet II*. The interface is called e.g. en0-1 for *Ethernet II* and en0-1-snap for *Ethernet SNAP*.
Mode	Defines the mode in which the interface is operated. Possible values: ■ *100 Mbps Full Duplex* ■ *Auto* (default value) ■ *10 Mbps Half Duplex* ■ *10 Mbps Full Duplex* ■ *100 Mbps Half Duplex*

Field	Description
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. *00a0f906bf03*.
VLAN ID	Only for *IP CONFIGURATION VLAN*. Here you can assign the Ethernet interface to a VLAN by entering the relevant VLAN ID.

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

Table 3-1:   **ETHERNET** menu fields

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

■   **ADVANCED SETTINGS**

■   **VIRTUAL INTERFACES**.

3.1   Submenu Advanced Settings

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

```
R232bw Setup Tool              Funkwerk Entreprise 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 18, 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 18, 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 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 3-2: *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 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.

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

3.2 Submenu Virtual Interfaces

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

```
R232bw Setup Tool               Funkwerk Entreprise 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 21.
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	Defines the kind of header added to the IP packets that run over this interface. Possible values: ■ *Ethernet II* (conforms to IEEE 802.3, default value) ■ *Ethernet SNAP* ■ *none* You can generally retain the default value *Ethernet II*. The interface is called e.g. en0-1 for *Ethernet II* and en0-1-snap for *Ethernet SNAP*.
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 3-4:   *VIRTUAL INTERFACES* submenu fields

IP CONFIGURATION contains the following selection options:

Description	Meaning
Manual (default value)	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 3-5:   Selection options in *IP CONFIGURATION*

3.2.1 Submenu Advanced Settings

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

Description

Index: Ethernet