X4000

Release Notes

System Software Release 5.1 Revision 6

September 21, 2000

New System Software

System Software Release 5.1.6

This document describes the features, changes, bugfixes and known issues of the system software in Release 5.1.6 for **X4000**.

1 Updating System Software

- Get the System Software Release 5.1 Version 6 from BinTec's WWW server at www.bintec.de (Products/Download section) or at www.x4000.de.
- You can then update **X4000** with this system software (see chapter 10.2 "Updating Software" in your User's Guide).
- When you have installed Release 5.1 Version 6, you will certainly want to obtain the latest documentation as well (in Adobe's PDF format). You will also find this in the Download section of BinTec's WWW server.

When you update the system software, it is recommended that you also use the latest versions of BRICKware for Windows and the UNIX Tools. You can load these from BinTec's WWW server.

2 New Features in 5.1.6

2.1 Expansion Cards Now Supported

With Release 5.1.6, **X4000** can be operated with an expansion card.

Please note:

To operate **X4000** with an expansion card, an update of System Software Release 5.1.6 and an update of Logic and BOOTmonitor is necessary (see Release Notes Logic and BOOTmonitor available from BinTec's WWW server at www.bintec.de, Products/Download section).

With Release 5.1.6, you don't need to enter a license to activate the ports of the expansion card. Each port on the expansion card can be used.

With one of the following releases, a licensing procedure will be implemented.

Keep the license information delivered with the expansion card. With that following release you will have to use the license information to download the license key from www.bintec.de required for acitvating the port(s) of the expansion card. Only the port(s) activated with a license will be available.

We recommend downloading the license key BEFORE you update the **X4000** with the future system software including the licensing procedure! Note the appropriate Release Notes.

With Release 5.1.6, hardware support for encryption and compression on the expansion card X4E-1/2PRI is not supported yet.

The configuration of expansion cards is described in the User's Guide (version 1.3), available on the BinTec Companion CD 5.1.5 or on the download page of BinTec's WWW server.

Some minor changes have been made in the Setup Tool concerning the expansion and resource cards (see chapter 3.1.2, page 8 and chapter 3.1.3, page 10).

3 Changes in 5.1.6

3.1 Setup Tool

3.1.1 WAN Partner Entries for Serial Interfaces

In the Setup Tool, a WAN partner entry for each serial interface is generated by default. These entries were preset with **Encapsulation** = *X.25*. As from now they are preset with **Encapsulation** = *PPP*.

```
X4000 Setup Tool                                BinTec Communications AG
[WAN]: WAN Partners                                              X4000


    Current WAN Partner Configuration

        Partnername      Protocol         State
        si3-0            ppp              up
        si3-1            ppp              up



    ADD          DELETE           EXIT

Press<Ctrl-n>,<Ctrl-p>to scroll,<Space>tag/untag DELETE,<Return>toedit
```

This change takes effect only if no configuration has been saved in flash before or if **X4000** is returned to an unconfigured ex works state.

3.1.2 Configuring a G.703 Interface with Setup Tool

The configuration of a G.703 interface of an X4E-2/3PRI card has changed in comparison with the description in the User's Guide (version 1.3), chapter 9.2.

When configuring a G.703 interface in the Setup Tool menu ***X4E-2PRI, ISDN S2M*** ➧ ***UNIT 0*** or ***UNIT 1***, *G.703* is selected under the field **ISDN Switch Type** not under **ISDN Line Framing**.

```
X4000 Setup Tool                              BinTec Communications AG
[MODULE X4E-2PRI][UNIT0 ISDN S2M]:Configure ISDN S2M Interface   X4000

    Result of autoconfiguration:     running
    ISDN Switch Type                 G.703

    Clock Mode                       external


    Incoming Call Answering >
                    SAVE                        CANCEL
```

Proceed as follows to configure a G.703 interface:

- Go to ***X4E-2PRI, ISDN S2M*** ➧ ***UNIT 0*** or ***UNIT 1***.
- Select **ISDN Switch Type**: *G.703*.
- Select **Clock Mode**: e. g. *external*
- Confirm with **SAVE**.

3.1.3 Resource Cards Available on X4000

To see the hardware equipment of **X4000** at a glance, the new field **Resources:** is now available in the Setup Tool main menu.

```
BINTEC-X4000 Setup Tool                          BinTec Communications AG
                                                                  X4000

Licenses                  System

LAN:          CM-100BT,Fast Ethernet   Module:      X4E-3BRI, ISDN S0

WAN:          CM-1BRI,ISDN S0          Resources:   XTR-S

Serial WAN:   CM-SERIAL,Serial

WAN Partner
IP       IPX      PPP      MODEM    ISDN     CAPI

Configuration Management
Monitoring and Debugging
Exit

Press <Ctrl-n>,<Ctrl-p> to scroll through menu items,<Return> to enter
```

Under **Resources:** the following values can be shown:

Value	Meaning
XTR-S	resource card with 8 digital modems (can be upgraded to XTR-M)
XTR-M	resource card with 12 digital modems
XTR-2M	resource card with 24 digital modems
XTR-L	resource card with 30 digital modems
XTR-ENC	■ resource card for encryption and compression or ■ hardware support for encryption and compression (PRI expansion card)

Table 3-1: Resource cards of **X4000**

4 Bugfixes in 5.1.6

4.1 Syslog Message "TX underrun"

In some cases, an Ethernet problem caused the syslog message "TX underrun".

This problem has been fixed.

4.2 DNS Proxy Could Not Resolve DNS Requests from Windows 2000

When PCs running Windows 2000 sent DNS requests to the **X4000**'s DNS Proxy and a negative static name entry existed for a requested name, the **X4000** tried to resolve the name instead of answering the request negatively and not passing it to another name server. This way unwanted connections were established, generating costs.

This bug has been fixed.

4.3 The Transport Control Field in IPX RIP Update Packets had the Wrong Value

In IPX RIP update packets generated by the **X4000**, the Transport Control Field contained the wrong value 1 instead of 0.

This bug has been fixed, now the Transport Control Field has the value 0 when the packet is generated by the **X4000**.

4.4 Setup Tool: Reorganization of BOD (Bandwidth on Demand) Rules was not Possible

In Setup Tool menu ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***RULES FOR BOD*** ➧ **REORG**, a reorganization of BOD rules was not possible.

This bug has been fixed, the BOD rules can be reorganized as usual.

4.5 Problems Concerning MMI Display

In some cases, problems occurred concerning the MMI display of **X4000**.

This bug has been fixed.

4.6 Problems with Telnet Clients

When trying to establish a connection to **X4000** via telnet, an unusual behaviour occurred with a few more recent telnet clients. The clients ran in the wrong mode.

This bug has been fixed.

5 Known Issues in 5.1.6

5.1 Current Status of Credits Based Accounting System Cannot be Displayed via MMI

The MMI screen **Credits Based Accounting System** under the main menu **Information about X4000 Basic Unit** can be displayed, but no information is available yet.

To display the respective information, go to Setup Tool menu ***ISDN*** ➧ ***CREDITS***.

5 Known Issues in 5.1.6

6 New Features in 5.1.5

6.1 Always On/Dynamic ISDN (AO/DI)

The multiprotocol router **X4000** provides AO/DI with System Software Release 5.1.5.

Always On/Dynamic ISDN (AO/DI) uses the existing ISDN infrastructure to configure a new service for the user without hardware changes: AO/DI is a permanently available (always on) but nevertheless low-cost connection from the end customer to the Internet Service Provider.

6.1.1 Short Description

AO/DI uses X.25 data packet transmission in the D-channel (X.31) to set up a PPP connection (PPP over X.25). 9600 bps are available for data transmission in the D-channel (D-channel Mode). If more bandwidth is needed, one or two B-channels are dynamically added (Dynamic ISDN). Data transmission in this case is only in the B-channel or B-channels, i.e. the B-channels remain reserved for bandwidth-intensive applications (B-channel Mode).

AO/DI offers the following advantages:

- three full communication channels, which can be independent if required
- permanent connection to the Internet at low-cost
- transparent bandwidth control
- in D-Channel Mode
  - high reliability and guaranteed throughput times
  - volume-oriented charges independent of distance
- in B-Channel Mode:
  - time-dependent connection charges only for bandwidth-intensive applications

6.1.2 How Does AO/DI Work?

AO/DI is implemented in **X4000** via a special PPP interface. As soon as the interface is configured and ready for operation, the initial PPP connection is set up via X.31 (X.25 in the D-channel). This involves carrying out authentication of the PPP connection partner and assigning a dynamic IP address and DNS addresses, if applicable (AO/DI Client Mode).

The use of the B-channels is controlled by the data throughput or by application-dependent bandwidth management (Bandwidth on Demand, BOD for IP-based applications). Both Bandwidth on Demand and BOD for IP-based applications uses the Bandwidth Allocation Control Protocol (BACP/BAP to RFC 2125) in order to agree with the remote terminal on the circumstances under which B-channels are to be added or dropped. The use of BACP/BAP is agreed during the initial connection setup. As the D-channel connection is normally no longer ended after connection setup, it represents a permanently available (always on) connection to the provider.

As soon as the bandwidth of the D-channel is no longer adequate for data transmission, B-channels are added and data transmission takes place exclusively in the B-channels (Dynamic ISDN). This is implemented in **X4000** by an advanced configuration option in the IP subsystem. An interface is assigned filters, rules and rule chains similar to the concept for IP Access Lists (see User's Guide, chapter 9.2.8 "Filters (Access Lists)". These rules can be used to determine whether additional B-channels are to be set up for certain protocols, ports or IP addresses, or whether data transfer is to take place exclusively in the D-channel.

6.1.3 How is AO/DI Configured?

This chapter contains the following information:

- A summary of the configuration steps for AO/DI in **X4000** (see Configuration Steps, page 17).

- Configuration of **X4000** for AO/DI using the Setup Tool (Configuration with the Setup Tool, page 18).

You will find some configuration examples of BOD for IP-based applications in chapter 6.1.4, page 27.

Configuration Steps

The following steps are necessary for configuring **X4000** for AO/DI:

- Carry out X.31 configuration, i.e. reserve the TEI (Terminal Endpoint Identifier) value for X.25 (Packet Switch) (see X.31 configuration, page 18)
- Carry out X.25 configuration (see X.25 configuration, page 18):
  - Link configuration for Datex-P
  - Call routing
- Configure AO/DI partner as WAN partner (see Configuring AODI partner as WAN partner, page 20)
  - Select PPP parameters
  - Define the PPP interface as AO/DI interface
  - Enter X.25 destination address for initial connection setup
  - Control Bandwidth on Demand (dynamic B-channel bundling)
  - Control BOD for IP-based applications

Please note the following when carrying out X.25 configuration:

Some of the X.25 parameters must be adapted to the X.25 network connected. For Datex-P, the **Windowsize/Packetsize Neg.** field must be deactivated using the Setup Tool.

For **X4000**, the X.25 software is designed as an X.25 switch. This switch must be appropriately configured for AO/DI (see X.25 configuration, page 18).

Configuration with the Setup Tool

This section describes all the necessary steps for configuring **X4000** for AO/DI with the Setup Tool.

X.31 configuration

Proceed as follows to assign X.31/X.25:

- Go to ***CM-1BRI, ISDN S0*** ➧ ***ADVANCED SETTINGS***.
- Select **X.31 TEI Value**: *specify*.
- Enter **Specify TEI Value**: *1*.
- Select **X.31 TEI Service**: *Packet Switch*.
- Press **SAVE**.
  You have returned to the ***CM-1BRI, ISDN S0*** menu.
- Press **SAVE**.
  You have returned to the main menu. The main menu now contains the X.25 menu, which you need for the following configuration steps. Information about the X.25 parameters can be found in the Extended Features Reference at www.bintec.de.

X.25 configuration

Proceed as follows to make the preset link settings for X.25 configuration for Datex-P:

- Go to ***X.25*** ➧ ***LINK CONFIGURATION***.
- Select the interface for which you want to configure X.25, e.g. *x31d2-0-1*.

The following parts of the menu are relevant for this configuration step:

Field	Meaning
L3 Packet Size	Permissible size of data packets for this connection on the third layer of the OSI model.
Windowsize/Packetsize Neg.	Negotiation of the size of **Windowsize** and **Packetsize** with the remote terminal. There is only one meaningful setting for Datex-P: *never*, i.e. negotiation is deactivated.
Highest Two-Way-Channel (HTC)	Defines the highest number of virtual channels.

Table 6-1: ***X.25*** ➧ ***LINK CONFIGURATION*** ➧ ***EDIT***

- Select **L3 Packet Size max**: *256*.
- Select **Windowsize/Packetsize Neg.**: *never*.
- Enter **Highest Two-Way-Channel (HTC)**: *1*.
- Press **SAVE**.
- Leave ***X.25*** ➧ ***LINK CONFIGURATION*** with **Exit**.

Proceed as follows to make the preset routing settings for X.25 configuration:

- Go to ***X.25*** ➧ ***ROUTING*** ➧ ***ADD***.

The following parts of the menu are relevant for this configuration step:

Field	Meaning
Source Link	Source interface of data packets.
Destination Link	Destination interface of data packets.
Destination X.25 Address	X.25 destination address

Table 6-2: ***X.25*** ➧ ***ROUTING*** ➧ ***ADD***

- Select **Source Link**: *local*.
- Select **Destination Link**, e.g. *x31d2-0-1*.
- Enter **Destination X.25 Address**, e.g. *019011*.
- Press **SAVE**.
- Leave ***X.25*** ➧ ***ROUTING*** ➧ ***ADD*** with **Exit**.
- Leave ***X.25*** ➧ ***ROUTING*** with **Exit**.
  You have returned to the main menu.

Configuring AODI partner as WAN partner

To define an AO/DI-capable PPP interface, proceed as follows:

- Go to ***WAN PARTNER*** ➧ ***ADD***.
- Enter **Partner Name**, e.g. *AODI partner*.
- Select **Encapsulation**: *PPP*.

Proceed as follows to make the PPP settings:

- Go to ***WAN PARTNER*** ➧ ***ADD*** ➧ ***PPP***.
- Select **Authentication**, e.g. *CHAP*.
- Leave out **Partner PPP ID**.
- Enter **Local PPP ID**, e.g. *bintec_router*.
- Enter **PPP Password** twice, e.g. *secret*.
  An asterisk appears on the screen as a place marker for each letter you enter for the password.
- Confirm with **OK**.

To activate AO/DI on the PPP interface and enter the X.25 address, proceed as follows:

- Go to ***WAN PARTNER*** ➧ ***ADD*** ➧ ***ADVANCED SETTINGS***.

The following part of the menu is relevant for this configuration step:

Field	Meaning
Layer 1 Protocol	Defines which Layer 1 Protocol **X4000** is to use. There is only one meaningful setting for AO/DI: *AO/DI*.
Channel Bundling	Defines whether or which type of channel bundling is to be used for connections to the WAN partner (see manual, chapter 7.2.2). If *AO/DI* is selected under **Layer 1 Protocol**, *dynamic* is set automatically for **Channel Bundling**.
Total Number of Channels	Defines the maximum number of channels that may be opened for dynamic channel bundling. Possible values for **X4000**: 1 or 2.
Remote X.25 Address	X.25 destination address. Appears only if *AO/DI* is selected under **Layer 1 Protocol**.

Table 6-3: ***WAN Partner*** ➧ ***Add*** ➧ ***Advanced Settings***

- Select **Layer 1 Protocol**: *AO/DI*.
- Enter **Total Number of Channels**, e.g. *1*.
- Enter **Remote X.25 Address**, e.g. *019011*.

Proceed as follows to configure BACP/BAP for the "AO/DI client" access (control of Bandwidth On Demand):

- Go to ***WAN Partner*** ➧ ***add*** ➧ ***Advanced Settings*** ➧ ***extended Interface Settings (optional)***.

The following part of the menu is relevant for this configuration step:

Field	Meaning
Mode	Defines which mode is used for BOD. Only the *BAP, Active Mode* setting is used for an AO/DI client.
Line Utilization Weighting	Weighting within the interval considered for adding and dropping B-channels.
Line Utilization Sample (sec)	Length of the interval over which the mean of the measured throughput data is taken and weighted with **Line Utilization Weighting**.
Gear Up Threshold	Utilization threshold at which another B-channel is added for a connection.
Gear Down Threshold	B-channels are dropped until the remaining channels have at least the percentage utilization degree remaining here.
D-Channel Queue Length	Threshold value for the number of bytes accumulated in the D-channel at which the system is to change to the B-Channel Mode.
Maximum Number of Dialup Channels	Maximum number of channels that may be opened. The value is defined in the **Total Number of Channels** field under ***WAN PARTNER*** ➧ ***ADD*** ➧ ***ADVANCED SETTINGS***.

Table 6-4: ***WAN PARTNER*** ➧ ***ADD*** ➧ ***ADVANCED SETTINGS*** ➧ ***EXTENDED INTERFACE SETTINGS (OPTIONAL)***

The following selection option in the **Mode** field is relevant for AO/DI:

Possible Values	Meaning
BAP, Active Mode	The Bandwidth Allocation Protocol (BAP) knows three different options for negotiating a bandwidth change. It behaves as follows in Active Mode: ■ Call Request: one of the two communication partners wants to add a B-channel; adding the channel is initiated if applicable. ■ Callback Request: the remote terminal is requested to add a B-channel; adding the channel is not initiated but accepted if applicable. ■ Link Drop Request: one communication partner wants to drop a B-channel; dropping is initiated or accepted if applicable.

Table 6-5: **Mode** = *BAP, Active Mode*

- Select **Mode**: *BAP, Active Mode*.
- Use the preset values for the other fields of this menu.
- Press **SAVE**.
- Confirm with **OK**.

To enter the necessary ISDN extensions for adding the B-channel, proceed as follows:

- Go to ***WAN Partner*** ➧ ***add*** ➧ ***WAN Numbers*** ➧ ***add***.
- Enter the **Number**, e.g. *0911123456*.
- Select **Direction**: *outgoing*.
- Press **SAVE**.

➤ Leave ***WAN PARTNER*** ➧ ***ADD*** ➧ ***WAN NUMBERS*** ➧ ***ADD*** with **Exit**.

For dynamic assignment of the IP address by the Internet Service Provider, proceed as follows:

➤ Go to ***WAN PARTNER*** ➧ ***ADD*** ➧ ***IP***.

➤ Select **IP Transit Network**: *dynamic client*.

➤ Press **SAVE**.

➤ Press **SAVE**.

➤ Leave ***WAN PARTNER*** with **Exit**.
You have returned to the main menu.

BOD for IP-based applications (optional)

BOD for IP-based applications is configured by filters and rules in a similar way to Access Lists for IP packets (see manual, chapter 9.2.8 "Filters (Access Lists)"). First filters are defined that determine which IP packets (and thus applications) are to influence the available bandwidth. If several filters are defined, they can be interlinked using a rule chain.

Proceed as follows to define suitable filters:

➤ Go to ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***FILTER*** ➧ ***ADD***.

➤ Enter **Description**, e.g. *mail_smtp_out*.

➤ Select **Protocol**, e.g. *tcp*.

➤ Enter **Destination Address**, e.g. *172.16.08.15*.

➤ Enter **Destination Mask**, e.g. *255.255.255.255*.

➤ Select **Destination Port**: *specify*.

➤ Enter **Specify Port**, e.g. *25* (port for SMTP).

➤ Press **SAVE**.
A list of all the previously defined filters appears.

➤ Leave ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***FILTER*** with **Exit**.

A rule for BOD is configured similarly to a rule for IP packets (see manual, chapter 9.2.8 "Filters (Access Lists)"). Different rules normally consist of different filters and can be interlinked to form a rule chain. Each rule results in an action, but the direction of the data packets for which it is to apply can also be stated for each rule, i.e. for sent or received data packets.

Proceed as follows to define a rule for BOD:

➤ Go to ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***RULES FOR BOD*** ➧ ***ADD***.

In addition to the already familiar fields for definition of conventional rules (see manual, chapter 9.2.8 "Filters (Access Lists)"), the menu also contains the following fields:

Field	Meaning
Direction	Direction of data packets to which the rule is to be applied. Possible values: ■ *incoming*: incoming data packets ■ *outgoing*: outgoing data packets ■ *both*: incoming and outgoing data packets
Number of Channels	Number of B-channels that are to be added. Possible values for **X4000**: 1 or 2.

Table 6-6: ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***RULES FOR BOD*** ➧ ***ADD***

The **Action** field, which indicates how a filtered out data packet is to be handled, contains the following selection options:

Possible values	Meaning
invoke M	B-channels are added if the rule matches.
invoke !M	B-channels are added if the rule does not match.
deny M	B-channels are not added if the rule matches.
deny !M	B-channels are not added if the rule does not match.
ignore	The rule is ignored or it is omitted if part of a rule chain.

Table 6-7: Action

- Select **Action**: *invoke M*.
- Select **Direction**: *outgoing*.
- Select **Number of Channels**: *1*.
- Select **Filter**, e.g. *mail_smtp_out*.
- Press **SAVE**.
- Leave ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***RULES FOR BOD*** with **Exit**.
- Leave ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** with **Exit**.
  You have returned to the main menu.

To apply a rule to an interface, proceed as follows:

- Go to ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***CONFIGURE INTERFACES FOR BOD***.
- Select the interface to which you wish to apply a rule, e.g. *aodiclient*, and press **Return**.
- Select the rule you wish to apply to this interface, e.g. *mail_smtp_out*.
- Press **SAVE**.

- Leave ***IP*** ➧ ***Bandwidth on Demand (BOD)*** ➧ ***Configure Interfaces for BOD*** ➧ ***Edit*** with **Exit**.
- Leave ***IP*** ➧ ***Bandwidth on Demand (BOD)*** ➧ ***Configure Interfaces for BOD*** with **Exit**.
- Leave ***IP*** ➧ ***Bandwidth on Demand (BOD)*** with **Exit**.
  You have returned to the main menu.

6.1.4 Configuration Examples of BOD

Additional Bandwidth for HTTP Connections

The following example shows a special configuration of **X4000** for connection setup of the PC with the IP address 172.16.77.11 (TCP Port 80) to the Internet. The system should always change to B-Channel Mode with one B-channel when an HTTP connection is set up to the Internet.

Proceed as follows to define the relevant filter for BOD:

- Go to ***IP*** ➧ ***Bandwidth on Demand (BOD)*** ➧ ***Filter*** ➧ ***Add***.
- Enter **Description**: *hostxy_http_out*.
- Select **Protocol**: *tcp*.
- Enter **Source Address**: *172.16.77.11*.
- Enter **Source Mask**: *255.255.255.255*.
- Select **Destination Port**: *specify*.
- Enter **Specify Port**: *80*.
- Press **SAVE**.
  A list of all the previously defined filters appears.
- Leave ***IP*** ➧ ***Bandwidth on Demand (BOD)*** ➧ ***Filter*** with **Exit**.

Proceed as follows to define a rule for BOD:

- Go to ***IP*** ➧ ***Bandwidth on Demand (BOD)*** ➧ ***Rules for BOD*** ➧ ***Add***.
- Select **Action**: *invoke M*.

- Select **Direction**: *outgoing*.
- Select **Number of Channels**: *1*.
- Select **Filter**: *hostxy_http_out (1)*.
- Press **SAVE**.
- Leave ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***RULES FOR BOD*** with **Exit**.

Restricting Mail Reception to D-Channel

In the following configuration example, mail reception is restricted to the D-channel and there is no change to B-Channel Mode. The inquiry about whether new mails have been received does not cause a change to B-Channel Mode either.

Proceed as follows to define the relevant filter for BOD:

- Go to ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***FILTER*** ➧ ***ADD***.
- Enter **Description**: *mail_pop3_in*.
- Select **Protocol**: *tcp*.
- Enter **Destination Address**: *172.16.08.15*.
- Enter **Destination Mask**: *255.255.255.255*.
- Select **Destination Port**: *specify*.
- Enter **Specify Port**: *110*.
- Press **SAVE**.
  A list of all the previously defined filters appears.
- Leave ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***FILTER*** with **Exit**.

Proceed as follows to define a rule for BOD:

- Go to ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***RULES FOR BOD*** ➧ ***ADD***.
- Select **Action**: *deny*.
- Select **Direction**: *incoming*.

- Select **Number of Channels**: *1*.
- Select **Filter**: *mail_pop3_in (2)*.
- Press **SAVE**.
- Leave ***IP*** ➧ ***BANDWIDTH ON DEMAND (BOD)*** ➧ ***RULES FOR BOD*** with **Exit**.

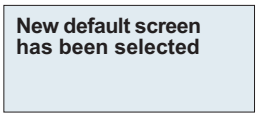
6.2 Man-Machine Interface (MMI)

BinTec's man-machine interface with display and input keys is equipped with a number of new features in Release 5.1.5.

6.2.1 Defining Default Screen

The logo is displayed as standard on the screen when the idle timer expires. If you want to use another screen as default screen for the MMI, proceed as follows:

- Use the input keys to indicate the desired screen.
- Keep the **C** key pressed for three seconds.



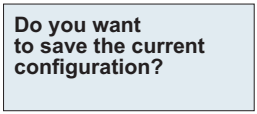
- Confirm with **OK**.

  The selected screen is shown and used as default screen.

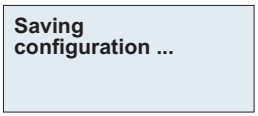
6.2.2 Saving the Configuration

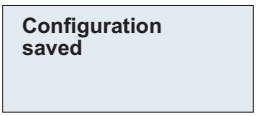
Proceed as follows to save the current configuration of **X4000** using the input keys.

➤ Keep the **OK** key pressed for three seconds.



➤ Press **OK**.



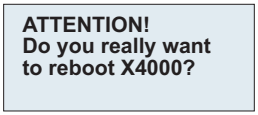


➤ Press **OK**.

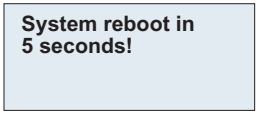
6.2.3 Restarting X4000

Proceed as follows to restart **X4000** using the input keys:

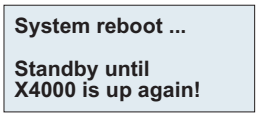
➤ Keep the **OK** key and **C** key pressed for three seconds.



➤ Press **OK**.

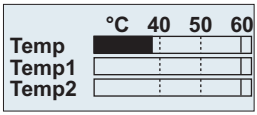


The restart is executed after 5 seconds.



6.2.4 Monitoring the Operating Temperature

In the new **Monitoring** main menu, you can display the current operating temperature of **X4000** in ˚C by selecting **Current Temperature**.



The current operating temperature is always indicated by a black bar. **Temp** shows the temperature measured by a sensor in the basic unit, **Temp1** and **Temp2** show the temperature measured on the expansion card. A PRI expansion card is equipped with two temperature sensors and a BRI or LAN expansion card with one sensor (**Temp1**).

The current maximum permissible temperature is 60 ˚C and is indicated by a continuous line on the display. The maximum permissible temperature can be changed by editing the MIB variable **sysX4ConfigTempAlarmTrap** for the basic unit (Temp) and the MIB variables **sysX4ConfigTempAlarmTrapMod1** / **sysX4ConfigTempAlarmTrapMod2** for the expansion cards (Temp1 and Temp2). If this temperature is exceeded, **X4000** generates traps, which can be evaluated over the network.

7 Changes in 5.1.5

7.1 Serial Interfaces

The **X4000** basic unit is equipped with two serial WAN interfaces, whose full range of features is available in Release 5.1.5:

- The first serial port (Setup Tool menu ***CM-SERIAL, SERIAL, UNIT 0***) can be used as interface types
  - X.21/V.11
  - V.35/V.11
  - V.36/V.11

  The setting in the Setup Tool **Connector** field (see chapter 7.1.2, page 34) enables the port to be changed so that **X4000** can be operated in both DCE and DTE Mode.

Making the relevant settings in the Setup Tool **Connector** field physically reverses the signal direction and the pin functions.

- The second serial port (Setup Tool menu ***CM-SERIAL, SERIAL, UNIT 1***) can be used as interface type
  - X.21bis/V.28

  The change from DCE to DTE Mode and vice versa for this port can only be made by using a DCE or DTE cable.

	Interface Type	DTE Mode	DCE Mode
Port 1	X.21 V.35 V.36	Standard cable **Connector** = *dte*	Standard cable **Connector** = *dce*
Port 2	X.21bis	DTE cable	DCE cable

Table 7-1: Functionality of serial ports

Please note: If you have already used the first serial port for X.21 with a previous release, you must carry out the X.21 configuration again after the update to System Software 5.1.5 due to changes in the MIB.

7.1.1 Connecting

The cables to be used are not supplied with **X4000**, but can be ordered from your dealer.

We recommend you use original BinTec cables, which you can buy from your dealer.

The use of other cables may cause damage to your equipment and invalidates the guarantee!

Refer to the description of the interfaces in chapter 7.1.3, page 39.

7.1.2 Configuration with the Setup Tool

The configuration of the serial interfaces has been slightly modified over previous releases. The relevant Setup Tool menus in Release 5.1.5 are as follows:

```
X4000 Setup Tool                              BinTec Communications AG
[SLOT 3 UNIT 0 SERIAL]:Configure Serial Interface             MyRouter


    Interface Type       X.21
    Connector            dte
    Clock Mode           auto
    Speed                64000 bps
    Layer 2 Mode         auto

    Interface Leads      disabled


                SAVE                        CANCEL

Use <Space> to select
```

The menus have the following fields:

Field	Meaning
Interface Type	Defines the interface type of the port used. Possible values: ■ *none* (default value): Interface is not used. ■ *X.21*: Use as X.21/V.11 interface ■ *V.35*: Use as V.35/V.11 interface ■ *V.36*: Use as V.36/V.11 interface ■ *X.21bis*: Use as X.21bis/V.28 interface
Connector	Defines the pin assignment of the port (see table 7-3, page 38). This setting only affects the pin assignment for the first serial port ***CM-SERIAL, SERIAL, UNIT 0***; a suitable DCE or DTE cable must be used for the second serial port ***CM-SERIAL, SERIAL, UNIT 1***! Possible values: ■ *dte* (default value): The pins are assigned as DTE interface. This setting is necessary, for example, if **X4000** is connected to a public data network (e.g. Datex-P in Germany). ■ *dce*: The pins are assigned as DCE interface.

Field	Meaning
Clock Mode	Defines which connection partner sends the clock signal for synchronization between transmitter and receiver. Possible values: ■ *auto* (default value): The setting is based on the **Connector** selected: – **X4000** sends the clock signal if **Connector** = *dce*. – **X4000** receives the clock signal if **Connector** = *dte*. You can usually accept this setting. ■ *external*: **X4000** receives the clock signal, irrespective of the setting selected under **Connector**. ■ *internal*: **X4000** sends the clock signal, irrespective of the setting selected under **Connector**.
Speed	Transmission rate of connection, scalable from *2400 bps* to *8 Mbps*. The value to be set depends on the quality and length of the cable and on the connection type (balanced/unbalanced). Up to 8 Mbps are possible over a short distance of up to 5 m if shielded cables are used. Default value: *64000 bps*

Field	Meaning
Layer 2 Mode	Defines the value of the HDLC address field in the transmitted command frames (Layer 2). Possible values: ■ *auto* (default value): The selection made for **Connector** is accepted, i.e. – if **Connector** = *dte*, the value of the address field is 0x01. – if **Connector** = *dce*, the value of the address field is 0x03. You can usually accept this setting, e.g. for access to a public data network such as Datex-P. ■ *dte:* The value of the address field is 0x01. ■ *dce:* The value of the address field is 0x03.
Interface Leads	Defines whether **X4000** checks the status of the interface lines. The same value should be set for both connection partners. Possible values: ■ *enabled:* The status of the signal line (I for X.21, CTS for V.35, V.36 and X.21bis) is checked and transferred as **L1State**. ■ *disabled* (default value): The status is not checked; the physical line is always up. In this setting, you should monitor the interface line in some other way, e.g. with PPP Keepalive.

Table 7-2: ***CM-SERIAL, SERIAL, UNIT 0*** or ***CM-SERIAL, SERIAL, UNIT 1***

	Connector = DTE (default value)	Connector = DCE	Port
Function	DTE	DCE	1
Cables	Standard cable		
Pin assignment	X.21: see table 7-4, page 40 V.35: see table 7-5, page 42 V.36: see table 7-6, page 44		
Function	DTE	DCE	2
Cables	DTE cable	DCE cable	
Pin assignment	X.21bis: see table 7-7, page 45		

Table 7-3: Using **Connector** in the Setup Tool

Proceed as follows to configure the serial interfaces (the example values given are necessary if you connect **X4000** to Datex-P):

- Go to ***CM-SERIAL, SERIAL, UNIT 0*** or ***CM-SERIAL, SERIAL, UNIT 1.***
- Select **Interface Type**, e.g. ***X.21***.
- Select **Connector**, e.g. ***dte***.
- Select **Clock Mode**, e.g. ***auto***.
- Select **Speed**, e.g. ***64000 bps***.
- Select **Layer 2 Mode**, e.g. ***auto***.
- Select **Interface Leads**, e.g. ***disabled***.
- Press **SAVE**.

7.1.3 Pin Assignment of Interfaces

The description below first deals with the connectors that are generally used for X.21, V.35, V.36 and X.21bis interfaces:

- DB-15 connector for X.21 (see DB-15 Connector for X.21, page 40)
- M34 connector for V.35 (see M34 Connector for V.35, page 41)
- DB-37 connector for V.36 (see DB-37 Connector for V.36, page 43)
- DB-25 connector for X.21bis (see DB-25 Connector for X.21bis, page 45)

This is followed by a description of the two serial **X4000** ports used for implementing the stated interfaces in **X4000**:

- 26-pole mini Delta ribbon socket for X.21, V.35 and V.36 (see Pin Assignment of X.21/V.35/V.36 Interface X4000, page 46)
- 20-pole mini Delta ribbon socket for X.21bis (see Pin Assignment of X.21bis Interface of X4000, page 49)

DB-15 Connector for X.21

A DB-15 connector to ISO 4903 is normally used for an X.21 interface:

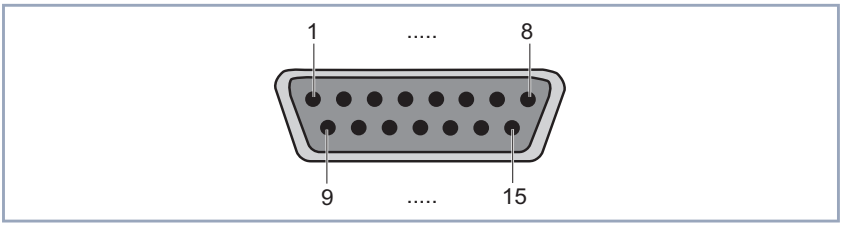


Figure 7-1: DB-15 connector (DTE)

The DB-15 connector (DTE) and socket (DCE) has the following pin assignment:

Variable connector = DTE		Signal direction Pin no.	Variable connector = DTE	
ITU-T	Signal		Signal	ITU-T
101	PG	—— 1 ——	PG	101
102	SG	—— 8 ——	SG	102
103	T+	9 ——>	R+	104
103	T-	2 ——>	R-	104
104	R+	<——11	T+	103
104	R-	<—— 4	T-	103
105	C+	10 ——>	I+	106
105	C-	3 ——>	I-	106
106	I+	<—— 12	C+	105
106	I-	<—— 5	C-	105
115	S+	<—— 13	S+	114
115	S-	<—— 6	S-	114

Table 7-4: Pin assignment of DB-15 connector for X.21 (ISO 4903)

M34 Connector for V.35

An M34 connector to ISO 2593 is normally used for a V.35 interface:

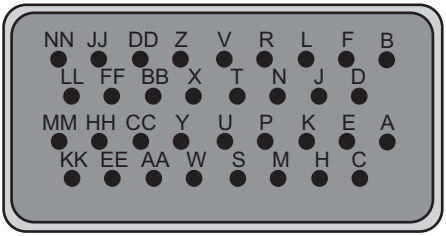


Figure 7-2: M34 connector

The M34 connector has the following pin assignment:

Variable connector = DTE		Signal direction Pin no.	Variable connector = DTE	
ITU-T	Signal		Signal	ITU-T
101	ChGND	—— A ——	ChGND	101
102	SigGND	—— B ——	SigGND	102
103	TDA	P ———>	RDA	104
103	TDB	S ———>	RDB	104
104	RDB	<——— R	TDB	103
104	RDA	<——— T	TDA	103
105	RTS	C ———>	CTS	106
106	CTS	<——— D	RTS	105
115	RCA	<——— V	TCA	114
115	RCB	<——— X	TCB	114
108/2	DTR	H ———>	DSR	107
109	DCD	<——— F	DCD	109
107	DSR	<——— E	DTR	108/2
114	TCB	<——— Y	TCB	114
114	TCA	<——— AA	TCA	114

Table 7-5: Pin assignment of M34 connector for V.35 (ISO 2593)

DB-37 Connector for V.36

A DB-37 connector to ISO 4902 is normally used for a V.36 interface:

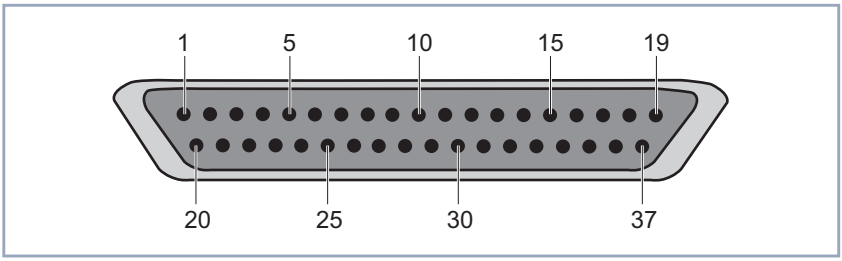


Figure 7-3: DB-37 connector

The DB-37 connector has the following pin assignment:

Variable connector = DTE		Signal direction Pin no.	Variable connector = DCE	
ITU-T	Signal		Signal	ITU-T
101	ChGND	—— 1 ——	ChGND	101
102	SigGND	—— 19 ——	SigGND	102
103	TDB	22 ——>	RDB	104
103	TDA	4 ——>	RDA	104
104	RDB	<—— 24	TDB	103
104	RDA	<—— 6	TDA	103
105	RTSB	25 ——>	RTSB	106
105	RTSA	7 ——>	CTSA	106
106	RTSB	<—— 27	RTSB	105
106	CTSA	<—— 9	RTSA	105
115	RCB	<—— 26	TCB	114
115	RCA	<—— 8	TCA	114
108/2	DTRB	30 ——>	DSRB	107
108/2	DTRA	12 ——>	DSRA	107
109	DCDB	<—— 31	DCDB	109
109	DCDA	<—— 13	DCDA	109
107	DSRB	<—— 29	DTRB	108/2
107	DSRA	<—— 11	DTRA	108/2
114	TCB	<—— 23	TCB	114
114	TCA	<—— 5	TCA	114

Table 7-6: Pin assignment of DB-37 connector for V.36 (ISO 4902)

DB-25 Connector for X.21bis

A DB-25 connector to ISO 2110 is normally used for a X.21bis interface:

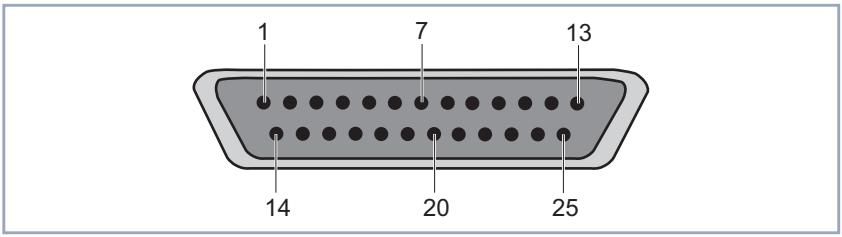


Figure 7-4: DB-25 connector

The DB-25 connector has the following pin assignment:

DTE cable		Signal direction	DCE cable	
ITU-T	Signal	Pin no.	Signal	ITU-T
101	ChGND	——— 1 ———	ChGND	101
103	TD	2 ———>	RD	104
104	RD	<——— 3	TD	103
105	RTS	4 ———>	CTS	106
106	CTS	<——— 5	RTS	105
107	DSR	<——— 6	DTR	108/2
102	SigGND	——— 7 ———	SigGND	102
109	DCD	<——— 8	DCD	109
114	TxC	<——— 15	TxC	114
115	RxC	<——— 17	RxC	115
108/2	DTR	20 ———>	DSR	107
113	XTC	24 ———>	RxC / TxC	114/115
	VCC +5V	——— 25 ———	VCC +5V	

Table 7-7: Pin assignment of DB-25 connector for X.21bis (ISO 2110)

Pin Assignment of X.21/V.35/V.36 Interface X4000

The serial X.21/V.35/V.36 interface of **X4000** is designed as a 26-pole mini Delta ribbon socket. The interface can be used for X.21, V.35 or V.36, depending on the setting under **Interface Type**.

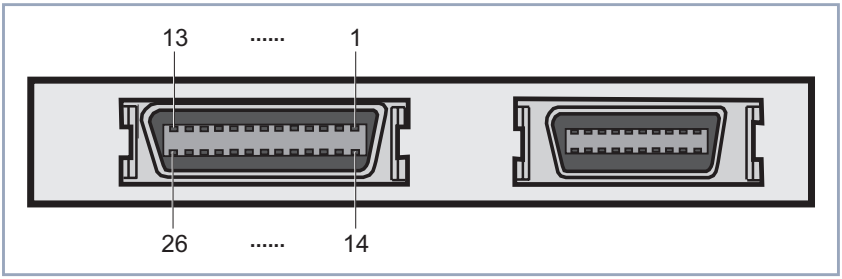


Figure 7-5: 26-pole mini Delta ribbon socket (first serial port, left)

The 26-pole mini Delta ribbon socket has the following pin assignment (DTE mode):

ITU-T	Direction and pin no.	X.21 pin (DB-15)		V.35 pin (M34)		V.36 pin (DB-37)	
101	—— 1 ——	1	PG	A	ChGND	1	ChGND
102	—— 2 ——	8	SG	B	SigGND	19	SigGND
103	3 ——>	9	T+	S	TDB	22	TDB
103	4 ——>	2	T-	P	TDA	4	TDA
104	<—— 5	11	R+	T	RDB	24	RDB
104	<—— 6	4	R-	R	RDA	6	RDA
105	7 ——>	10	C+			25	RTSB
105	8 ——>	3	C-	C	RTS	7	RTSA
106	<—— 9	12	I+			27	CTSB
106	<—— 10	5	I-	D	CTS	9	CTSA
115	<—— 11	13	S+	X	RCB	26	RCB
115	<—— 12	6	S-	V	RCA	8	RCA
108/2	15 ——>					30	DTRB
108/2	16 ——>			H	DTR	12	DTRA
109	<—— 17					31	DCDB
109	<—— 18			F	DCD	13	DCDA
107	<—— 19					29	DSRB
107	<—— 20			E	DSR	11	DSRA
114	<—— 21			AA	TCB	23	TCB
114	<—— 22			Y	TCA	5	TCA
VCC+5V	—— 25 ——						

Table 7-8: Pin assignment of 26-pole mini Delta ribbon socket (DTE mode)

The 26-pole mini Delta ribbon socket has the following pin assignment (DCE mode):

ITU-T	Richtung und Pin-Nr.	X.21-Pin (DB-15)		V.35-Pin (M34)		V.36-Pin (DB-37)	
101	—— 1 ——	1	PG	A	ChGND	1	ChGND
102	—— 2 ——	8	SG	B	SigGND	19	SigGND
104	3 ——>	9	R+	S	RDB	22	RDB
104	4 ——>	2	R-	P	RDA	4	RDA
103	<—— 5	11	T+	T	TDB	24	TDB
103	<—— 6	4	T-	R	TDA	6	TDA
106	7 ——>	10	I+			25	RTSB
106	8 ——>	3	I-	C	CTS	7	CTSA
105	<—— 9	12	C+			27	RTSB
105	<—— 10	5	C-	D	RTS	9	RTSA
114	<—— 11	13	S+	X	TCB	26	TCB
114	<—— 12	6	S-	V	TCA	8	TCA
107	15 ——>					30	DSRB
107	16 ——>			H	DSR	12	DSRA
109	<—— 17					31	DCDB
109	<—— 18			F	DCD	13	DCDA
108/2	<—— 19					29	DTRB
108/2	<—— 20			E	DTR	11	DTRA
114	<—— 21			AA	TCB	23	TCB
114	<—— 22			Y	TCA	5	TCA
VCC+5V	—— 25 ——						

Tabelle 7-9: Pin assignment of 26-pole mini Delta ribbon socket (DCE mode)

Pin Assignment of X.21bis Interface of X4000

The serial X.21bis interface of **X4000** is designed as a 20-pole mini Delta ribbon socket.

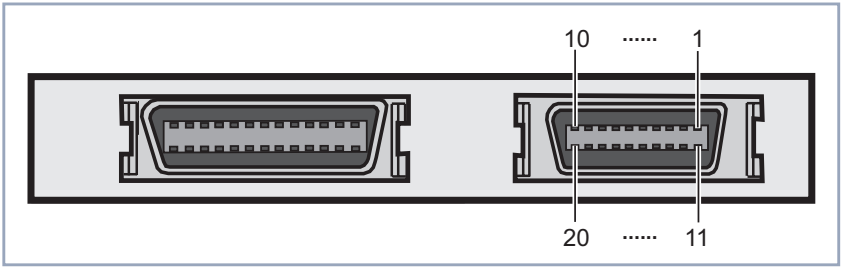


Figure 7-6: 20-pole mini Delta ribbon socket (second serial port, right)

The 20-pole mini Delta ribbon socket has the following pin assignment (DTE cable for DTE Mode, DCE cable for DCE Mode):

DTE/DCE			
ITU-T	**Signal**	**Signal direction Pin no.**	**X.21bis (DB-25)**
101	ChGND	—— 1 ——	1
103	TD	2 ——>	2
104	RD	<—— 3	3
105	RTS	4 ——>	4
106	CTS	<—— 5	5
107	DSR	<—— 6	6
102	SigGND	—— 7 ——	7
109	DCD	<—— 8	8
108/2	DTR	9 ——>	20
113	XTC	11 ——>	24
114	TxC	<—— 12	15
115	RxC	<—— 13	17
	VCC +5V	—— 14 ——	

Table 7-10: Pin assignment of 26-pole mini Delta ribbon socket

7.2 Encryption

7.2.1 Additional Encryption Protocols Supported

Release 5.1.5 of BinTec's **X4000** supports the MPPE V2, DES and Blowfish encryption algorithms. DES and Blowfish are implemented as BinTec proprietary solutions.

MPPE V2

The MPPE Version 2 encryption protocol, the successor to MPPE, has been developed by Microsoft and also uses a 40-bit or 56-bit key. These are generated on authentication.

If a larger key length is set in **X4000** than in the dial-in client, the connection is not set up.

If one connection partner is set to MPPE V1 as encryption protocol, MPPE V2 is also accepted on connection setup if the set key length is the same.

DES and Blowfish

The DES and Blowfish encryption algorithms are only supported if a license for VPN is entered in **X4000**.

If these proprietary encryption algorithms are used, either **X4000** can generate a key automatically or you can define an individual key statically in consultation with the connection partner.

Configuration with the Setup Tool

For **Encryption** in the ***WAN PARTNER*** ➧ ***EDIT*** menu, the following encryption protocols are now offered for selection (only available if **Encapsulation** is set to *PPP*, *Async PPP over X.75*, *Async PPP over X.75/T.70/BTX* or *X.25_PPP*):

Possible Values	Meaning
MPPE 40	MPPE version 1 with 40-bit key
MPPE 56	MPPE version 1 with 56-bit key
MPPE V2 40	MPPE version 2 with 40-bit key
MPPE V2 56	MPPE version 2 with 56-bit key
DES 56	DES with 56-bit key
Blowfish 56	Blowfish with 56-bit key
none	No encryption

Table 7-11: ***WAN PARTNER*** ➧ **EDIT**

If DES or Blowfish are used, the key can be generated automatically with authentication or defined statically. The following new fields have been added to the ***WAN PARTNER*** ➧ **EDIT** ➧ ***ADVANCED SETTINGS*** ➧ ***EXTENDED INTERFACE SETTINGS (OPTIONAL)*** menu for this purpose:

Field	Meaning
Encryption Key Negotiation	Defines whether a key for the connection to the WAN partner is generated automatically or defined statically. Possible values: ■ *authentication* (default value): Key is generated automatically by **X4000**. ■ *static*: The key is defined statically and must be entered under **Encryption Key (TX)** and **Encryption Key (RX)**.
Encryption Key (TX)	(Only for **Encryption Key Negotiation** = *static*) Key (in hexadecimal format) for encryption of outgoing data (must be the same as the entry under **Encryption Key (RX)** at the connection partner's).
Encryption Key (RX)	(Only for **Encryption Key Negotiation** = *static*) Key (in hexadecimal format) for encryption of incoming data (must be the same as the entry under **Encryption Key (TX)** at the connection partner's).

Table 7-12: ***WAN PARTNER*** ➧ **ADD** ➧ ***ADVANCED SETTINGS*** ➧ ***EXTENDED INTERFACE SETTINGS (OPTIONAL)***

Example

Proceed as in the following example to exchange data in encrypted form with a WAN partner:

- Go to ***WAN PARTNER*** ➧ **EDIT**.
- Select **Encryption**, e.g. *DES 56*.
- Go to ***WAN PARTNER*** ➧ **ADD** ➧ ***ADVANCED SETTINGS*** ➧ ***EXTENDED INTERFACE SETTINGS (OPTIONAL)***.
- Select **Encryption Key Negotiation**, e.g. *static* (if you wish to define the key yourself).
- Enter **Encryption Key (TX)**, if applicable, e.g. *1A35EFC17B56*
- Enter **Encryption Key (RX)**, if applicable, e.g. *89A1288CD131*
- Press **SAVE**.
- Confirm with **OK**.
- Press **SAVE**.

7.3 IPX

7.3.1 Default Value for NetBIOS Broadcast Replication Changed to *no*

Until now, *yes* was the preset default value for **NetBIOS Broadcast Replication** in the ***IPX*** menu. In Release 5.1.5, the default setting is *no*.

These settings prevent unwanted WAN connections through sending NetBIOS requests, which cause costs.

8 Bugfixes in 5.1.5

8.1 Frame Relay

Description: It was not possible to transmit data from **X4000** to the remote terminal over a point-to-point connection configured over frame relay. Outgoing packets were incorrectly encapsulated by **X4000** and rejected by the remote terminal.

Current status: This bug has been fixed in Release 5.1.5.

8.2 OSPF

Description: OSPF could not be used, as **X4000** could send multicast frames but not receive them.

Current status: This bug has been fixed in Release 5.1.5.

8 Bugfixes in 5.1.5