



RELEASE NOTE BIANCA/BRICK-X21

April 1, 1999

New System Software:

Release 4.9 Revision 5

This document describes the new features made to the BIANCA/BRICK-X21 System Software for Release 4.9 Revision 5.

New System Software:	1	NEW
Upgrading System Software	2	
What's New in Release 4.9.5		
Features.....	3	
Channel bundling over different media		

Upgrading System Software

1. Retrieve the current system software image from BinTec's WWW server at <http://www.bintec.de> (Section: FTP Server).
2. With this image you can upgrade the BIANCA/BRICK-X21 with the **update** command from the SNMP shell via a remote host (i.e. using telnet, minipad, or isdnlogin) or by using the **BOOTmonitor**, if you are logged in directly on the console. Information on using the BOOTmonitor can be found in the *BIANCA/BRICK-X21 User's Guide* under *Firmware Upgrades*.
3. Please note that there is an update procedure in case there is not enough memory available to perform a software update via the **update** command from the SNMP shell.

The new incremental update loads the new software image in blocks of 64 KB via TFTP and writes it to the Flash ROM immediately. Because this procedure offers no possibility to check the integrity of the image, please first use the option “-v” that verifies the image file.

What's New in Release 4.9.5

Release 4.9 Revision 5:

Features:

Changes:

Bugfixes:

Features

Channel Bundling over Different Media

This feature meets the increased demand for the bundling of fixed as well as fixed and dial-up connections to a multilink PPP interface. Several lines and connection paths to a partner can be used for backup operation as well as for making more bandwidth available. Here are three possible scenarios:

- It is conceivable to combine several hyperchannels each with a bandwidth of 1984000 bit/s to become a leased line bundle with x-times this bandwidth.
- Another possibility would be to realise the dynamic bandwidth adjustment of an X.21 leased line by switching on or off other ISDN B-channels.
- Also AODI (Always on Dynamic ISDN) would only be implementable with this feature (?). In this case, available bandwidth is increased when necessary by switching additional B-channels to a PPP over X.25 leased line in the ISDN D-channel (?).

1. Bandwidth on Demand (BOD) for Leased Line Interfaces

(Ziel ist es?) In addition to pure backup operation, it is now possible to define BOD over a new optional table in the PPP group, without having to adjust or modify old partner configurations. The current functionality of backup configuration over two (or more) WAN partners and IP routes remains the same.

The new MIB table in the PPP group with default values:

Variables		
inx Index (*rw)	BodMode (-rw)	Algorithm (rw)
Interval (rw)	Load (ro)	MlpFragmentation (rw)
MlpFragSize (rw)		

pppExtIfTable	example	values
o4 5000	backup	equal
5	0	proportional
50		

The meaning of the different variables:

- IfIndex: interface index of the relevant leased line interface.
- BodMode can be set for:
 1. Backup operation only.
 2. Active or passive mode for switching channels on or off, also includes backup operation after leased line failure.
 3. (In future, the activation of BACP)
 Contains the following values: backup, none_active, none_passive, (bacp_active, bacp_passive), delete
- Algorithm: algorithm for the weighting of throughput within a specified time frame for the calculation of capacity utilization (load). The following values are possible:

Equal: constantly weighted load over the given time frame.

Proportional: linear, i.e. current proportional weighting within the time frame in favour of the latest throughput values.

- **Interval:** maximum period in seconds for a throughput measurement which can be taken into the calculation of load.
- **Load:** a calculation of the capacity utilization of the bundle in % depending on the selected algorithmus.
- **MlpFragmentation:** a mode according to which MLP fragments are formed. The following values are possible:

Proportional: the fragment size taken from the available bandwidth of the individual links in relation to the total bandwidth of the bundle.

Equal: As far as is possible, fragments of equal size are formed, the weighting of the available bandwidth of a link is made by the number of fragments to be sent

- **MlpFragSize:** minimum fragment size in 'proportional' – otherwise maximum fragment size.

Use of the biboPPPDialTable for this interface

To be able to establish additional active BOD/backup links, one or more entries must be made in the DialTable. How the biboPPPDialDirection is set depends on whether a passive or active mode (in future, perhaps with or without the callback option) should be used and whether partner identification should be inband or outband via CLID.

Authentication

On establishing a PPP leased line or the corresponding LCP Aushandlung, though accepted, no authentication is requested by the partner. Authentication is sensible, however, for the switched dial-up link and should be configured in the biboPPPTTable accordingly. In this case, authentication of the partner is requested for incoming BOD/backup calls. In the case of an inband authentication, analagous to the dialup interfaces,

the authentication protocol is fixed via the configuration in the `biboPPPProfileTable`.

LCP Echo Requests (PPP keepalive)

LCP Echo Requests are only generated on existing leased lines, not, however, on the switched B-channels.

Static Short Hold

Terminates all BOD/Backup links after expiry of the inactivity timeout configured.

Dynamic Short Hold

If the `PPPTable` is correspondingly configured and AOCD (advice of charging during the call) is available, a B-channel is switched off just shortly before the beginning of the next charging unit on consideration of the current capacity utilization.

Switchover thresholds for BOD, maximum number of B-channels.

BOD is activated by setting the `pppExtIfBodMode` variable to 'active' or 'passive'. Switching only occurs in the active mode, i.e. one partner must be configured as an active part the other as a passive part, otherwise call collisions are unavoidable.

For the calculation of capacity utilization, the maximum amount of data sent or received is considered.

The maximum number of B-channels to be dynamically switched corresponds to the value of the variable `biboPPPMaxConn` of the `biboPPPTable`; `biboPPPMinConn` or `biboPPPInitConn` have no effect.

- ♦ Switching on of other B-channels:

If the `pppExtIfLoad` corresponds to the value 90 (%) or more for at least 5 seconds, a B-channel is switched on.

- ♦ Switching off of a B-channel:

The current value of `pppExtIfLoad` does not serve as the basis for switching off, the calculated (fictitious) bundle capacity utilization (load) after switching off of a B-channel does. If this value drops below 80 (%) for at least 10 seconds, a B-channel is switched off.

ISDN backup connections on the failure of a leased line

In the modes `pppExtIfBodMode_backup`, `pppExtIfBodMode_active` or `pppExtIfBodMode_passive`, as opposed to the behaviour of leased line interfaces up to now, the `IfOperStatus` is not set to 'down' but, analogous to the dialup interfaces, to 'dormant'. Backup connections are then initiated, if necessary, by the higher protocol levels such as IP or IPX by setting the `IfAdminStatus` to 'dialup', as long as other ISDN B-channels have not already been established by BOD. There is thus no necessity to define another interface for the backup case.

Backup connections are only then established when data is also to be routed over the relevant interface.

Bandwidth on Demand is also available for backup connections. The precondition, however, is that the maximum number of switchable B-channels in the `PPPTable` (`biboPPPMaxConn`) is correspondingly configured, i.e. set to greater than 1. Switching on and off, dependent on the load, then occurs from the side that established the backup connection.

When the leased line is available again, the backup connection is terminated shortly after in the 'backup' mode. In 'bod_active' or 'bod_passive' mode, switching off occurs depending on the measured load of the connection.

2. Bandwidth on Demand (BOD) for Pure Dial-up Line Interfaces

The extensions to the `pppExtIfTable` that can also be used for dialup line interfaces are limited to the following variables: `pppExtIfAlgorithm`, `pppExtIfInterval`, `pppMlpFragmentation` and

MlpFragSize. Furthermore, these extensions are only available for the ppp, x75_ppp as well as the x75btx_ppp encapsulations.

The current load value can also be taken from the pppExtIfLoad variable.

As opposed to the previous approach, there is the extended configuration option of B-channel bundling.

The value of the pppExtIfBodMode variable must be set to 'bod_active'.

The maximum number of B-channels to be dynamically switched corresponds to the value of biboPPPMaxConn or biboPPPTable variables. By means of the biboPPPMinConn or biboPPPInitConn, parallel to the old algorithmus, the number of B-channels to be statically established is controlled for channel bundling.

In contrast to the behaviour of the fixed line interface, there is no static configuration for which partner performs load-dependent switching. The available bandwidth is always controlled by the side that initially established the connection.

3. Relevance of the remaining variables in the biboPPPTable

	Dialup & BOD	Leased &BOD/ BACKUP
Encapsulation	only ppp, x75_ppp, x75btx_ppp	only ppp, x75_ppp, x75btx_ppp
Timeout	Yes	Yes
IpAddress	Yes	No
RetryTime	Yes	Yes
BlockTime	Yes	Yes
MaxRetries	Yes	Yes
ShortHold	Yes	Yes
InitConn	Yes	NO
MaxConn	Yes	Yes
MinConn	Yes	No
CallBack	Yes	No
Layer1Protocol	Yes	Yes
LoginString	Yes	No
VJHeader- Comp	Yes	Yes
Layer2Mode	Yes	No
DynShortHold	Yes	Yes
DNSNegotia- tion	Yes	No
Encryption	Yes	Yes
LQMonitoring	Yes	Yes

	Dialup & BOD	Leased &BOD/ BACKUP
IpPoolId	Yes	No

4. Characteristics of BOD/backup for X.21 (PPP) leased lines (DTE page?)

The setting up of ISDN backup connections on the failure of X.21 leased lines depends on the configuration in the X.21IfTable for the corresponding interface.

Backup behaviour is not, however, controlled by X.21IfL1State, but by the x.21IfLeads variable.

When IfLeads=enabled, as long as data is to be routed, the backup line is initiated immediately after the relevant hardware signals are received. When IfLeads=disabled, no pulse can be measured (SpeedReal=0) from the DCE side over a period of ten seconds (biboPPPTimeOut) before an ISDN connection can be established.

Variables and example entries in the X21IfTable:

Variables		
inx Index (*ro)	L1State (ro)	L1Mode (rw)
IfLeads (rw)	Speed(rw)	l2Mode (rw)
SpeedReal (ro)	RxPackets (ro)	RxOctets (ro)
TxPackets (ro)	TxOctets (ro)	RxResets (ro)
RxAborts (ro)	RxOverruns (ro)	RxCRCErrors (ro)
RxGiantFrames (ro)	TxResets (ro)	TxAborts (ro)

Variables		
TxUnderruns (ro)	TxGiantFrames (ro)	

pppExtIffable	example	values
o0 3000	up	dte
enabled	s64000	auto
64000	305849	386881311
305982	387189340	0
0	0	2
0	0	0
0	0	

5. Configuration Examples in Setup Tool

BIANCA/BRICK-XM Setup Tool		BinTec Communications AG
[WAN]: WAN Partners		mybrick
Current WAN Partner Configuration		
Partnername	Protocol	State
Leased, Slot 2 (0)	ppp	down
Partner_1	ppp	down
xi3	ppp	up
ADD	DELETE	EXIT
Press, to scroll, tag/untag DELETE, to edit		

BIANCA/BRICK Setup Tool		BinTec Communications AG
[WAN] [EDIT]: Configure X.21 Leased LineWAN Partners		mybrick
Partner Name	xi3	
Encapsulation	ppp	
Compression	STAC	
Encryption	none	
PPP >		
Advanced Settings >	>==	
IP >		
IPX >		
Bridge >		
SAVE	CANCEL	
Press, to scroll, tag/untag DELETE, to edit		

BIANCA/BRICK Setup Tool		BinTec Communications AG
[WAN] [EDIT] [ADVANCED]: Advanced Settings		mybrick
Extended Interface Settings >	<==	
OK	CANCEL	
Press, to scroll, tag/untag DELETE, to edit		

BIANCA/BRICK Setup Tool		BinTec Communications AG
[WAN] [EDIT] [ADVANCED] [EXTIF] : Extended Interface Settingsd (xi3) mybrick		
Extended Interface Settings not configured yet!		
Mode		Bandwidth on Demand disabled
Line Utilization Weighting		equal
Line Utilization Sample (sec)	5	
Maximum Number of Dialup Channels	2	
==> SAVE CANCEL		
Press, to scroll, tag/untag DELETE, to edit		

BIANCA/BRICK Setup Tool		BinTec Communications AG
[WAN] [EDIT]: Configure X.21 Leased Line		mybrick
Partner Name	xi3	
Encapsulation	ppp	
Compression	STAC	
Encryption	none	
PPP >		
Advanced Settings >		
WAN Numbers >	>==	
IP >		
IPX >		
Bridge >		
SAVE CANCEL		
Press, to scroll, tag/untag DELETE, to edit		