User's Guide

bintec R4100 / R4300

ISDN PRI

Version 0.9

Purpose

This document is part of the user's guide to the installation and configuration of bintec gateways running software release 7.4.5 or later. For up-to-the-minute information and instructions concerning the latest software release, you should always read our **Release Notes**, especially when carrying out a software update to a later release level. The latest **Release Notes** can be found at www.funkwerk-ec.com.

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R&TTE Directive 1999/5/EG

CE marking for all EU countries and Switzerland

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1 ISDN PRI Menu

The fields of the *ISDN PRI2:4* resp. *ISDN PRI2:5* menu are described below.

```
R4100 Setup Tool                Funkwerk Entreprise Communication GmbH
[SLOT 2 UNIT 4 ISDN S2M]: Configure                            MyGateway
                          ISDN S2M Interface

Status:

  ISDN Switch Type        autodetection is waiting to run
  Layer 1                 no signal
  Layer 2                 connecting
  License usage           license missing
                          (avail: PRI: 0, G.703: 0)

Configuration:

  ISDN Switch Type        autodetect on bootup
  ISDN Line Framing       special (no CRC)


  Incoming Call Answering >

              SAVE                        CANCEL
```

In the ***ISDN PRI*** menu you configure the S2M (OPRI) interfaces of your gateway.

A primary rate interface, or PRI, is sometimes called an S2M interface. It provides 30 B-channels and one D-channel.

As with a BRI the D-channel is used for signalling but since 30 B channels need to be managed in a PRI, the D-channel has a data rate of 64 kbps. This allows for a total user data rate of 1.984 Mbps (31 x 64 kbps).

In North America, a PRI consists of 23 B-channels and one D-channel. The differences between the number of channels are historically based and relates to voice technologies that existed when ISDN was developed.

The menu for configuration of an S2M connection contains a status display in addition to the fields and submenus for the configuration.

The section on top of the menu provides status information on the ISDN protocol and layer activity of the PRI port and on license usage.

The ***LICENSE USAGE*** field indicates which license is used for the current configuration and how many of the licenses activated by you are still available (*not used*).

The ***STATUS*** fields cannot be modified. They show the current status of the PRI.

Configuration is carried out in the ***CONFIGURATON*** fields.

The menu consists of the following fields:

Field	Description
Status: ISDN Switch Type	Shows the currently valid protocol for this port and the status of ISDN autoconfiguration. Possible values: ■ *autodetection is waiting to run*: The gateway waits until Layer 1 becomes active. Autoconfiguration is then started. ■ *autodetection is running*: ISDN autoconfiguration is in progress. ■ *detected <any switch type name>*: The given protocol has been detected by ISDN autoconfiguration and is active. ■ *<any switch type name>*: Shows the ISDN protocol currently configured.
Status: Layer 1	Shows the physical status of the PRI port. Possible values: ■ *active*: Layer 1 is OK. ■ *no signal*: Possibly no cable or no license available. ■ *other information*: Defective cable or wrong value for ISDN Line Framing.

Field	Description
Status: Layer 2	Shows the status of the Layer 2 protocol LAPD of the D-channel. Possible values: ■ *connecting*: Layer 2 is not connected. ■ *established*: Layer 2 is connected.
Status: License usage	Shows which license is currently assigned to this port. Possible values: ■ *license missing*: The license needed for the ISDN protocol configured is not available. All available licenses are currently being used by other ports. ■ *not used*: A license is not required for the current configuration (or a license available is not being used). ■ *1 PRI*: One PRI license is used for this interface. ■ *1 G.703*: One G.703 license is used for this interface.

Field	Description
Configuration: ISDN Switch Type	Defines the ISDN protocol supplied by your ISDN provider. All switch types may be used with a PRI license. With a G.703 license, only leased line, 1 Hyperchannel (G.703 + G.704) and leased line, G.703 (unstructured, no G.704) may be chosen. Possible values: ■ *autodetect on bootup* (default value): automatic D-channel detection. ■ *Euro ISDN S2M user profile (TE)* ■ *Euro ISDN S2M network profile (NT)* ■ *1TR6 S2M user profile (TE)* ■ *1TR6 S2M network profile (NT)* ■ *back to back (dialup)* ■ *leased line, chan. B1..B31 diff. endpoints*: 31 PPP interfaces can be configured. Note: The physical time slot 16 is mapped to channel 0. ■ *leased line, chan. B1..B31 bundled*: 31 channels bundled to 1 interface with Multilink PPP. ■ *leased line, 1 Hyperchannel (G.703 + G.704)*: 1984 kbps, structured. ■ *leased line, G.703 (unstructured, no G.704)*: 2048 kbps. ■ *not used*: If you do not want to use this port and no license should be assigned. Note: Tested only for Euro ISDN.

Field	Description
Configuration: ISDN Line Framing	Not for ***ISDN SWITCH TYPE*** = *leased line, G.703 (unstructured, no G.704)* or *not used* Possible values: ■ *standard (CRC4)*: default setting. ■ *special (no CRC)* The default setting is adequate in most cases for a PRI interface. Occasionally (e.g. in Sweden and France), the setting special (no CRC) is necessary if the gateway is connected to a PABX.

Field	Description
Configuration: Channel Selection	Only for ***ISDN SWITCH TYPE*** = *Euro ISDN S2M user profile (TE)* To ensure compatibility with special service providers, a further option is provided for the ***ISDN SWITCH TYPE*** *Euro ISDN S2M user profile (TE)*: If you set the switch type appropriately, you can select a value for the new variable ***CHANNEL SELECTION***. This defines how the B-channel is selected for an outgoing call. Possible values are: ■ *standard (any channel)* (default value): The (PABX) network selects the channel to be used. ■ *no channel identification*: The gateway sends no IE (Information Element) for channel identification. The (PABX) network selects the channel to be used. ■ *submit preferred channel*: The gateway selects the channel to be used and signals this to the (PABX) network. You can usually keep the default setting. It is only necessary to change the setting in a few special cases. Ask your provider if a special setting is necessary.

Field	Description
Configuration: Clock Mode	Only for ***ISDN SWITCH TYPE*** = *back to back (dialup)* or *leased line, 1 Hyperchannel (G.703 + G.704)* or *leased line, G.703 (unstructured, no G.704)* Defines which connection partner sends the clock signal for synchronization between transmitter and receiver. If the clock signal is not generated by the (PABX) network itself, one of the two connection partners must generate this signal. Possible values: ■ *external* (default value): The gateway receives the clock signal. ■ *internal*: The gateway sends the clock signal.

Table 1-1: ***S2M*** menu fields

Note

If the ISDN protocol is not set correctly, an ISDN connection cannot be established and the provider's exchange (PABX) may disconnect the line if it is not used!

Make sure the gateway detects the ISDN protocol used correctly and displays it under ***STATUS: ISDN SWITCH TYPE*** as detected *<any switch type name>*. If not, enter it manually into ***ISDN SWITCH TYPE***. The automatic D-channel detection is then switched off.

For ***ISDN SWITCH TYPE*** = *autodetect on bootup, Euro ISDN S2M user profile (TE)*, *Euro ISDN S2M network profile (NT)*, *1TR6 S2M user profile (TE)*, *1TR6 S2M network profile (NT)* or b*ack to back (dialup)* the menu provides access to the ***INCOMING CALL ANSWERING*** submenu.

For ***ISDN SWITCH TYPE*** = *leased line, chan. B1..B31* the menu provides access to the ***BUNDLE CONFIGURATION*** submenu.

2 Submenu Incoming Call Answering

The *INCOMING CALL ANSWERING* submenu is described below.

```
R4100 Setup Tool                Funkwerk Entreprise Communication GmbH
[SLOT 2 UNIT 4 ISDN S2M][INCOMING][ADD]                        MyGateway


  Item                          PPP (routing)
  Number
  Mode                          right to left

  Bearer                        any


            SAVE                        CANCEL
```

The ***ISDN PRI*** ➜ ***INCOMING CALL ANSWERING*** ➜ ***ADD/EDIT*** submenu is for assigning the available ISDN numbers to the desired services (e.g. PPP routing, ➤➤ **ISDN Login**).

If you use the BRI for incoming and outgoing dialup connections, you must enter the own numbers for this interface (these settings are not possible for leased lines). The gateway distributes the incoming calls to the internal services according to the settings in this menu. Outgoing calls include the own number as calling party number.

The gateway supports the following services:

- PPP (Routing):
  The ➤➤ **PPP** (routing) service is the gateway's general routing service. This connects e.g. ISDN-WAN partners' data connections to your ➤➤ **LAN**. This enables partners outside your own local network to access hosts within your LAN. This subsystem also enables outgoing data connections to be set up to ISDN-WAN partners.
- ISDN Login:
  The ➤➤ **ISDN Login** service allows incoming data connections with access to the ➤➤ **SNMP shell** of the gateway as well as outgoing data con-

nections to other bintec gateways. This means the gateway can be configured and administrated remotely.

- The ➤➤ **CAPI** service allows connection of incoming and outgoing data and voice calls to communications applications on hosts in the LAN that access the ➤➤ **Remote CAPI** interface of your gateway. This enables, for example, hosts connected to your gateway to receive and send faxes.
  To be able to use CAPI applications from the hosts in the LAN with your gateway, you must also carry out the Remote CAPI configuration on the individual hosts in addition to distributing the extension numbers as described in this chapter.

When a call is received, the gateway first checks the called party number (CPN) and the type of call (data or voice call). The CPN is the extension the partner has dialed to reach the gateway. The call is then forwarded to the corresponding service.

Note

All incoming calls that do not match any of the existing entries, are transmitted to the CAPI service.

Note

If no settings have been made (ex works state), all incoming calls via ISDN are accepted by the ISDN-login service. To avoid this it is recommended to adjust the required settings of this menu.

The ***INCOMING CALL ANSWERING*** ➜ ***ADD/EDIT*** menu consists of the following fields:

Field	Description
Item	Service to which a call to the ***NUMBER*** below is to be assigned. Possible values: see table “Selection options for Item field,” on page 14.
Number	Phone number which is used to verify the called party number. It is sufficient, that only single figures of the entry match considering ***MODE***.

Field	Description
Mode	Mode in which your gateway compares the digits of ***NUMBER*** with the called party number of the incoming call: ■ *right to left* (default value) ■ *left to right (DDI)*: Always select if your gateway is connected to a point-to-point connection.
Bearer	Type of incoming call (service identifiation). Possible values: ■ *data*: Data call ■ *voice*: Voice call (modem, voice, analog fax) ■ *any*: both data and voice calls (default value)

Table 2-1: Fields in submenu ***INCOMING CALL ANSWERING***

The ***ITEM*** field contains the following selection options:

Description	Meaning
PPP (routing) (default value)	Default setting for ➤➤ **PPP** routing. Includes the automatic detection of the PPP connections listed below except *PPP DOVB*.
ISDN Login	Enables logging in with ➤➤ **ISDN Login**.
PPP 64k	Enables 64 kbps PPP data connections.

Description	Meaning
PPP DOVB	Data transmission Over Voice Bearer - useful in the USA, for example, where voice connections are sometimes cheaper than data connections. DOVB contains an automatic bandwidth modification from 64 kbps to 56 kbps. This function depends on the type of device. Ask the bintec Support (contact via www.funkwerk-ec.com) if DOVB can be used with your gateway.
PPP V.110 (1200...38400)	Permits PPP connections to V.110 at bit rates of 1200 bps, 2400 bps,..., 38400 bps.
PPP V.120	Permits incoming PPP connections to V.120.
X.25 PAD	X.25 PAD is a protocol converter that converts non-packet-orientated protocols into packet-orientated communication protocols and vice versa. Data terminal equipment that cannot send or receive packet-orientated data, can thus be connected to Datex-P (public packet switching network with packet switching exchange).
IPSec	Enables a number to be defined for IPSec callback.
X.25 over ISDN	By means of X.25 over ISDN your gateway can process X.25 calls between the PSTN and other networks transferring X.25 (i.e. X.21, Ethernet, TCP,...). It is e.g. used as dial-in node for POS.

Table 2-2: Selection options for ***ITEM*** field

3 Bundle Configuration Menu

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

In the ***ISDN PRI*** ➜ ***BUNDLE CONFIGURATION*** menu you have the facility to bundle channels on the Physical Layer.

In addition, PPP Multilink channel bundles can now be freely configured, i.e. the available timeslots can be combined to several PPP Multilink channel bundles.

Note

The here described functions are only available for leased lines.

For channel bundle configuration, it is necessary in the PRI interface menu to set ***ISDN SWITCH TYPE*** to *leased line, chan. B1..B31*. This provides access to the submenu ***BUNDLE CONFIGURATION***. The first window shows a list of the channel bundles already configured.

Note

Timeslots divide the available 2-Mbps bandwidth of an S2M connection into logical channels. No distinction is made below between timeslots and channels, as the difference is immaterial for configuration purposes.

The following menu appears if, for example, you have not defined any physical channel bundles, but have combined all channels in PPP Multilink bundles.

```
R4100 Setup Tool                 Funkwerk Entreprise Communication GmbH
[SLOT 2 UNIT 4 ISDN S2M][BUNDLE]: Bundle Configuration       MyGateway

Type  Name    Timeslots                              Channels
PPP   bundle4 01 - 31                                  31




              DELETE           EXIT
```

Note

Timeslots that are not assigned to a link bundle can be used vor 64 kb leased line WAN Partners.

The list contains the following data:

Field	Description
Type	Shows the type of channel bundle. Possible values are: ■ *PPP*: The channels are bundled as PPP Multilink channels. ■ *Physical*: The channels are bundled as physical hyperchannels.
Name	Shows the name assigned to this channel bundle.
Timeslots	Shows the logical channels (timeslots) combined to form this channel bundle.
Channels	Shows the number of bundled channels.

Table 3-1: ***BUNDLE CONFIGURATION*** menu fields

Select an existing entry or **ADD** to pass to the ***BUNDLE CONFIGURATION*** ➜ ***ADD/EDIT*** submenu. Here you can configure the desired channel bundle.

The following menu appears if you have defined no physical channel bundles, but have combined all channels into one PPP Multilink bundle:

```
R4100 Setup Tool                Funkwerk Entreprise Communication GmbH
[SLOT 2 UNIT 4 ISDN S2M][BUNDLE][ADD]                          MyGateway

 Bundle Type            PPP Multilink
 Interface Name         bundle1
 From Timeslot          1
 To Timeslot            31

 Used 31 Timeslots:

 1 <X>   6 <X>   11 <X>   16 <X>   21 <X>   26 <X>   31 <X>
 2 <X>   7 <X>   12 <X>   17 <X>   22 <X>   27 <X>
 3 <X>   8 <X>   13 <X>   18 <X>   23 <X>   28 <X>
 4 <X>   9 <X>   14 <X>   19 <X>   24 <X>   29 <X>
 5 <X>  10 <X>   15 <X>   20 <X>   25 <X>   30 <X>

 X.75 Layer 2 Mode      DTE
 Bundle Id              1

                   SAVE                                  CANCEL
```

The menu consists of the following fields:

Field	Description
Bundle Type	Here you define the type of channel bundle. Possible values are: ■ *PPP Multilink* ■ *Physical (Hyperchannel)*
Interface Name	Shows the name of the interface that is created in the ***WAN PARTNER*** menu due to the channel bundle.
From Timeslot	Shows the first of the channels used for this channel bundle. If you select a configuration that uses unconnected channels, the first channel used is shown together with the comment *customized*, e.g. *6 customized*. If you wish to select a certain "start channel", you can do this here.

Field	Description
To Timeslot	Shows the last of the channels used for this channel bundle. If you select a configuration that uses unconnected channels, the last channel used is shown together with the comment *customized*, e.g. *31 customized*. If you wish to select a certain "stop channel", you can do this here.
Used x Timeslots	Shows the total number of channels used and a list of the individual channels that have been used. If you do not wish to use all the channels between a certain start and stop channel for a channel bundle, you can make a selective assignment here.
X.75 Layer 2 Mode	Here you define how the interface created by this channel bundle is to behave during connection setup. Possible values: ■ *dte* ■ *dce* You only have to configure this parameter if you use X.75 in layer 2.
Bundle Id	Here you assign the channel bundle a unique ID number. Possible values are *1* to *255*. The number of the first channel used is taken as the default value.

Table 3-2: ***BUNDLE CONFIGURATION*** ➜ ***ADD*** menu fields

Basically, there are no limitations on the configuration of the channel bundle (whether PPP Multilink or physical bundle) as far as the division of the channels

is concerned: It is possible to configure many small channel bundles as well as different types (PPP Multilink or physical bundle).

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