



Configuration of Frame Relay Interfaces over BRI ISDN

Teldat-Dm 731-I

Copyright© Version 10.71 Teldat SA

Legal Notice

Warranty

This publication is subject to change.

Teldat offers no warranty whatsoever for information contained in this manual.

Teldat is not liable for any direct, indirect, collateral, consequential or any other damage connected to the delivery, supply or use of this manual.

Table of Contents

I	Related Documents.	1
Chapter 1	Configuring FR over BRI ISDN.	2
1.1	Introduction	2
1.2	Creating the Generic FR Interface	2
1.3	Configuring the Generic FR Interface	3
1.3.1	BASE-INTERFACE	3
1.3.2	FR	5
1.3.3	EXIT	6
1.4	Configuring the BRI ISDN interface	6
1.4.1	Generic FR link over BRI ISDN interface semi-permanent channel	6
1.4.2	Generic FR link over BRI ISDN interface switched channel	6
Chapter 2	Monitoring FR over BRI ISDN	8
2.1	Generic FR interface statistics	8
2.2	Generic FR interface monitoring	8
2.2.1	Accessing the Generic FR monitoring prompt.	8
2.2.2	Generic FR monitoring commands	8
Chapter 3	Example of FR over BRI ISDN configuration	11
3.1	Configuration example of FR over BRI ISDN	11
3.1.1	Configuring the Interfaces	11
3.1.2	Configuring the BRI ISDN interface	11
3.1.3	Configuring the Dial Profile.	12
3.1.4	Configuring the base interface and the channel associated to the Generic FR Interface	12
3.1.5	Configuring the FR part of the Generic FR Interface	13
3.1.6	IP Configuration	13

I Related Documents

Teldat-Dm 703-I Frame Relay

Teldat-Dm 729-I BRI ISDN Interface

Teldat-Dm 732-I Dial Profile

Teldat-Dm 772-I Common Configurations for Interfaces

Chapter 1 Configuring FR over BRI ISDN

1.1 Introduction

This chapter describes the function of Frame Relay interface over BRI ISDN.

The information given in this chapter is divided into the following sections:

- Creating the Generic FR interface.
- Configuring the Generic FR interface.
- Configuring the ISDN Basic Rate Interface.

Should you have any doubts over the meaning of any of the Frame Relay interface own concepts, please consult manual Teldat-Dm 703-I Frame Relay.

1.2 Creating the Generic FR Interface

Should you wish to configure a Frame Relay interface over an ISDN BRI link B channel, you must enter the following command:

```
Config>add device fr <identifier>
```

Where <identifier> is a complete number (between 1 and 10000) used to differentiate and identify a specific interface from among all the existing interfaces of the same type.

Example:

```
Config>add device fr ?
<1..10000>   Interface Id
Config>add device fr 1 ?
<cr>
Config>add device fr 1
Config>
```

You can check that the new interface has been correctly added by listing the current interfaces present in the router (and verifying that the *Generic FR* interface has been generated):

```
Config>list devices

Interface          Connector      Type of interface
ethernet0/0        LAN1           Fast Ethernet interface
serial0/0           SERIAL0/WAN1  X25
serial0/1           SERIAL1/WAN2  X25
serial0/2           SERIAL2/WAN3  X25
bri0/0             BRI/ISDN1     ISDN Basic Rate Int
x25-node           ---           Router->Node
fr1                ---           Generic FR
Config>
```

The Generic Frame Relay interface is one of the interfaces which act as 'users' for the BRI ISDN base interfaces. This deals with a logical interface devoid of a physical connector.

You can configure various Generic Frame Relay interfaces over a single BRI ISDN base interface. The BRI ISDN interface can also be configured to support switched or semi permanent connections. This latter case does not require a call to be established in order to transmit data through the B channel.



Note

Please remember that you must save any changes made to the configuration and restart the device in order for the changes to take effect.

1.3 Configuring the Generic FR Interface

In order to configure a Generic FR interface over a BRI interface you need to enter **NETWORK <interface_name>** in the general configuration menu, where **interface_name** is the name of the associated interface. For example to access the FR1 interface, you need to enter:

```
Config>network fr1

-- Generic FR User Configuration --
fr1 config>
```

The following are the options presented in the Generic FR interface configuration menu:

```
frX config>?
  base-interface  Access the base interface configuration menu
  fr              Takes you to the Frame Relay configuration prompt
  exit
frX config>
```

In addition to the above commands, there are other commands which are common for all the device's interfaces. These commands are described in the manual on configuring common interfaces (Teldat-Dm 772-I Common Configurations for Interfaces).

1.3.1 BASE-INTERFACE

Through the **BASE-INTERFACE** command you can access the base interface configuration menu (in this case a BRI ISDN interface). In the *Base frX IFC config>* configuration menu, the parameters related with the FR link association over a BRI ISDN interface channel are specified.

```
frX config>base-interface

-- Base Interface Configuration --
frX Base IFC config>
```

The following commands are available from the *frX Base IFC config>* prompt:

```
frX Base IFC config>?
  base-interface  Specify a base interface
  list           List current configuration
  no             Negate a command or set its default
  exit
frX Base IFC config>
```

1.3.1.1 BASE -INTERFACE

The **BASE-INTERFACE** command permits you to specify the associated ISDN BRI interface, the number of the B channel through which you wish to establish the FR link (only used for semi-permanents connections) and the call profile name you wish to associate (in cases of switch links).

Syntax:

```
frX Base IFC config>base-interface <interface> <circuit_id> {link | profile <profile_name>}
```

Specifically, in cases of switch connections, the syntax is as follows:

```
frX Base IFC config>base-interface <interface> 255 profile <profile_name>
```

If you want a FR link to establish over a semi-permanent ISDN connection, given that it is not necessary to execute calls the call profile does not require configuring (and should one be specified, it will not be used). The syntax in this case is:

```
frX Base IFC config>base-interface <interface> <circuit_id> link
```

Example:

```
fr1 Base IFC config>base-interface ?
```

```

<interface>      Base interface
fr1 Base IFC config>base-interface bri0/0 ?
  <1..255>      Base circuit id
fr1 Base IFC config>base-interface bri0/0 255 ?
  link          Add this interface to the dial group
  profile       Dial profile to use with this interface
fr1 Base IFC config>base-interface bri0/0 255 profile ?
  <word>       Text
fr1 Base IFC config>base-interface bri0/0 255 profile prueba ?
  <cr>
fr1 Base IFC config>base-interface bri0/0 255 profile prueba
fr1 Base IFC config>

```



Note

The channel number (*circuit_id*) is only significant in cases of FR connections over SEMIPERMANT channels as in the case of switched channels, the channel is assigned when the call is executed (the configured value must be 255). Value 255 indicates that no channel is associated so if you are dealing with semi-permanent connections, the link will not be operative.

In cases where both B channels have been grouped in the ISDN BRI base interface, in order to configure the link over the said group, you can indicate either of the two channels that pertain to the group. However, we do recommend as a general rule to assign the lowest numbered channel i.e. number 1.

The *Dial Profile* permits you to associate the link with the indicated profile (which contains data such as the type of permitted calls, where the outgoing calls are directed, permitted incoming calls, the idle time etc.) If there is no dial profile associated, the link cannot be established (if the ISDN connection is switch).

For further information on Dial Profiles please see manual Teldat-Dm 732-I Dial Profile.

1.3.1.2 LIST

This command permits you to view the options configured in the base interface section.

```

fr1 Base IFC config>list

```

Base Interface	Profile Name	Base Circuit Id	Number of circuits
bri0/0	bri/0 prueba	255	1

```

fr1 Base IFC config>

```

“**Base interface**” this refers to the name of the base interface over which the FR interface is established (in this case it must be the number of the BRI ISDN interface associated). The text that appears after the interface name (bri/0) provides information on the interface type. This is useful when dealing with serial lines as it indicates whether the line is synchronous or asynchronous.

“**Profile name**” is the name of the call profile associated to the FR link. This identifier relates the circuit to the call characteristics it is going to have (source address, destination address, type of permitted calls etc.). This is only applicable for the Primary ISDN interface, as the E1 does not carry out calls.

“**Base Circuit Id**” this is the B channel number over which you wish to establish the connection. Either of the two available B channels may appear in the BRI (values 1 or 2) and additionally the value 255 (this indicates that the channels are switched and therefore the channel number is assigned on establishing the call). In cases where the two B channels are grouped in the ISDN BRI base interface, the connection is established over the group of two B channels and therefore the binary transfer rate will be 128 Kbps.

“**Number of circuits**” the number of base interface circuits that are going to be used. FR interfaces always use a single circuit.

1.3.1.3 NO

1.3.1.3.1 NO BASE-INTERFACE

The **NO BASE-INTERFACE** permits you to delete the current association with a base interface. You must specify the associated ISDN BRI interface and the channel number that was assigned as parameters.

```
fr1 Base IFC config>no ?
  base-interface      Specify a base interface
fr1 Base IFC config>no base-interface ?
  <interface>       Base interface
fr1 Base IFC config>no base-interface bri0/0 ?
  <1..255>          Base circuit id
  <cr>
fr1 Base IFC config>no base-interface bri0/0 255 ?
  <cr>
fr1 Base IFC config>no base-interface bri0/0 255
fr1 Base IFC config>
```

1.3.1.4 EXIT

This command exits the *frX Base IFC config>* configuration prompt.

```
frX Base IFC config>exit
frX config>
```

1.3.2 FR

The **FR** command takes you to the Frame Relay configuration prompt.

```
frX config>fr
-- Frame Relay user configuration --
frX FR config>
```

The commands that can be used within the Frame Relay configuration menu are the same as those described for normal interfaces over a serial line.



Note

The use of configuration commands for Frame Relay interfaces over a serial line is also valid for Frame Relay interfaces over ISDN. For further information please consult manual Teldat-Dm 703-I Frame Relay.



Important

In cases of configuring Frame Relay connections over ISDN with inverse ARP, it's convenient to configure an ARP retry period distinct to zero in order to ensure correct running.

Non-configurable parameters

Some specific Frame Relay parameters are not configurable in the Frame Relay interfaces over BRI ISDN. If you try to configure these, the following message will appear:

```
CLI Error: Option not supported on dial FR interfaces
CLI Error: Command error
```

The commands that cannot be used are displayed below:

- invert-txc
- set encoding nrz
- set encoding nrzi
- set idle flag
- set idle mark
- set line-speed

- set transmit-delay

These commands refer to the configuration of the serial line physical and HDLC parameters (these do not exist in Frame Relay interfaces over BRI ISDN).

1.3.3 EXIT

Through the **EXIT** command you return to the general configuration prompt, *Config*>.

Example:

```
fr1 config>exit
Config>
```

1.4 Configuring the BRI ISDN interface

In our router, there is the possibility to configure the BRI ISDN base interface. Generally, the parameters configured in this interface permit the router to adapt to the peculiarities of the distinct ISDN standards that exist. However, in the majority of cases, the default configuration is valid and it is unnecessary to configure any of the parameters within the BRI ISDN interface.

In order to correctly establish a FR link over a BRI ISDN interface with semi-permanent B channels you must correctly configure certain BRI ISDN interface parameters. The possibilities are:

1.4.1 Generic FR link over BRI ISDN interface semi-permanent channel

In this case, you need to configure the channel where you wish to establish the FR connection as semi-permanent (*permanent*).

1.4.2 Generic FR link over BRI ISDN interface switched channel

There must be a BRI ISDN interface channel configured as switched. The two B channels appear configured as switched in the default configuration.

The B channel type is configured through the **SET CIRCUIT TYPE** command. Firstly access the BRI ISDN interface configuration menu:

```
Config>network bri0/0

-- BRI ISDN Configuration --
bri0/0 BRI config>
```

The options presented in the BRI ISDN interface configuration menu are as follows:

```
bri0/0 BRI config?
  description      Enter interface description
  join-b1+b2       Associates B channels in a single pipeline at 128 Kbps
  leave-b1+b2      Separates B channels that were previously associated
  list             Displays the interface configuration information
  no               Negate a command or set its defaults
  set              Configures interface parameters
  shutdown         Change state to administratively down
  update           Update a level indicator
  exit
bri0/0 BRI config>
```

You can now configure the B channels. The two possible options are semi-permanent (*permanent*) or switched (*switched*).

```
bri0/0 BRI config>set circuit type ?
  permanent       Permanent connection type (Not Q.931 signalling)
  switched        Switched connection type
```

Example 1:

```
bri0/0 BRI config>set circuit type switched ?
```

```
<1..2>   Enter circuit
bri0/0 BRI config>set circuit type switched 1
bri0/0 BRI config>
```

Example 2:

```
bri0/0 BRI config>set circuit type permanent ?
<1..2>   Enter circuit
bri0/0 BRI config>set circuit type permanent 1
bri0/0 BRI config>
```

In addition to the type of B channel, you can also configure the maximum frame size used (MTU) in the interface, the maximum frame size for each channel and the grouping of the two B channels so that the total binary rate reaches 128 Kbps (provided the Network supports this). Other parameters related to the ISDN are also configurable, e.g. the numeration plan, standard used etc. In order to find out how to configure these parameters, please see manual Teldat-Dm 729-I BRI ISDN Interface.

Chapter 2 Monitoring FR over BRI ISDN

2.1 Generic FR interface statistics

The Generic FR interface over BRI ISDN statistics are displayed by entering the **DEVICE** command followed by interface name for the statistics you wish to obtain at the monitoring prompt (+).

```
+device fr1

Interface          CSR   Vect   Auto-test   Auto-test   Maintenance
                valids  failures  failures
fr1                 0     0         0           6           0
+
```

2.2 Generic FR interface monitoring

2.2.1 Accessing the Generic FR monitoring prompt

In order to access the Frame Relay over BRI ISDN monitoring prompt, you need to enter **NETWORK** following by the interface name.

```
+network fr1

Generic FR Console

fr1+
```

2.2.2 Generic FR monitoring commands

All Generic FR interface monitoring commands must be entered at the prompt specified above, *frX>*.

The available commands are described below.

2.2.2.1 ? (HELP)

This command permits you to view the available options from the menu you are in and to list the possible command options. The commands available in the corresponding console menu for monitoring Generic FR are as follows:

```
frX+?
  base-interface   Base interface monitor
  fr               Frame Relay protocol monitor
  exit
frX+
```

2.2.2.2 BASE-INTERFACE

The **BASE-INTERFACE** command takes you to the monitoring prompt for the parameters related to the base interface, which in this case is a BRI ISDN interface.

```
frX+base-interface

Base Interface Console

frX Base IFC+
```

The following commands are available at this level:

2.2.2.2.1 ? (HELP)

This lists the available commands.

```
frX Base IFC+?
                                list    Display base interface parameters
exit
frX Base IFC+
```

2.2.2.2.2 LIST

Displays the parameters related to the base interface.

```
frX Base IFC+list
Destination address   : 384200
Local address        :
Base interface       : bri0/0
Circuit id request   : 255
Dial circuit status  : OPEN
Circuit id assigned  : 1
frX Base IFC+
```

The meaning of the information displayed is as following:

“Destination address”	This is the link destination address i.e. the ISDN number called.
“Local address”	Local address (Local ISDN number).
“Base interface”	Base interface name or identification (BRI ISDN).
“Circuit id request”	The number of the channel through which you request the Frame Relay link establishment.
“Dial circuit status”	Current circuit status. The possible values are: <i>OPEN</i> , the circuit is open (established). <i>CLOSED</i> , the circuit is closed (not established). <i>DOWN</i> , the BRI ISDN interface is not active.
“Circuit id assigned”	The circuit number (channel B) associated to the link (in cases of Frame Relay links over switched circuits, although a determined circuit is configured, this is assigned when the call is established and does not, therefore, have to coincide with that requested).

2.2.2.2.3 EXIT

Exits the monitoring prompt for the parameters related to the base interface.

```
frX Base IFC+exit
frX+
```

2.2.2.3 FR

Through this command you can access the monitoring menu for Frame Relay interface own parameters. This is described in more detail in manual Teldat-Dm 703-I Frame Relay.

```
frX+fr
-- Frame Relay Console --
frX FR+
```

2.2.2.4 EXIT

This command exits the Generic FR interface monitoring prompt and returns to the previous prompt.

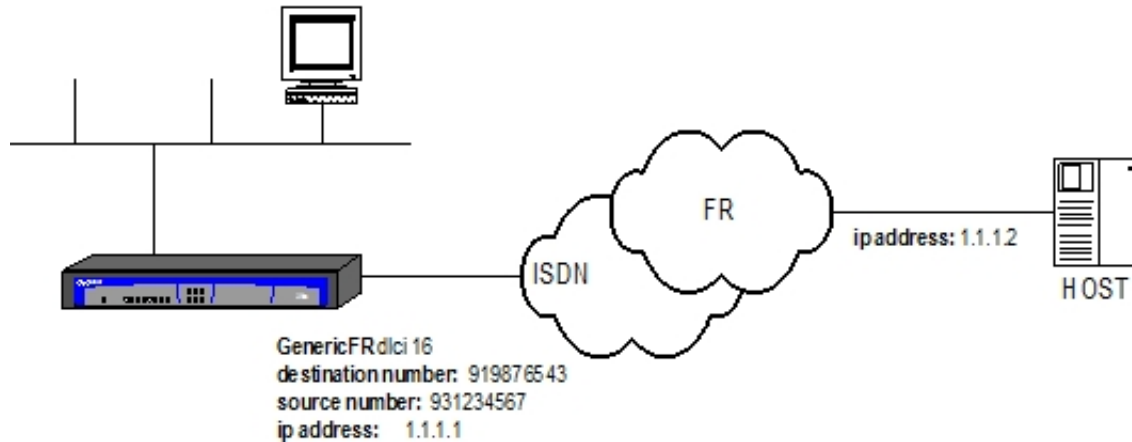
```
frX+exit
```

+

Chapter 3 Example of FR over BRI ISDN configuration

3.1 Configuration example of FR over BRI ISDN

Supposing we have a scenario such as the one that is displayed in the below figure. This deals with accessing a HOST through a Frame Relay PVC. The HOST is connected to the Frame Relay Network through a point-to-point line. The router accesses through ISDN, calling a determined telephone number which the operator has provided as the access point for the Frame Relay Network.



3.1.1 Configuring the Interfaces

Add the Generic FR interface.

```
*config
Config>add device fr 1
Config>list devices

Interface          Connector      Type of interface
-----
ethernet0/0        LAN1           Fast Ethernet interface
serial0/0           SERIAL0/WAN1  X25
serial0/1           SERIAL1/WAN2  X25
serial0/2           SERIAL2/WAN3  X25
bri0/0             BRI/ISDN1     ISDN Basic Rate Int
x25-node           ---           Router->Node
fr1                ---           Generic FR
Config>
```

3.1.2 Configuring the BRI ISDN interface

You do not need to configure any of the parameters as we are going to use switched circuits with MTU 2048 and without channel grouping. This is the default configuration. The local address is not configured either as this is not mandatory. The "local address" however is configured in the dial profile.

```
Config>network bri0/0

-- BRI ISDN Configuration --
bri0/0 BRI config>list

ISDN Standard      : EURO-ISDN
Emulation           : User
Type of number      : Unknown
Numbering Plan Identific : Unknown
Sending Complete    : Enabled
Alerting incoming calls : Disabled
```

```

Calling number presentat : Allowed
TEI Negotiation option   : First Call
Supervision interval     : 0
Supervision fails to down: 3
Local address            :
SPID Value for B1        :
SPID Value for B2        :
Maximum frame length     : 2048

          B1  B2
-----  ---  ---
MTU       2048 2048
Type      SW   SW
B1+B2

bri0/0 BRI config>exit
Config>

```

3.1.3 Configuring the Dial Profile

Here is where the parameters to be used in order to make and receive calls are configured. Introduce the name selected for the profile, the local number, the remote and the release time without data. The time, in this case, is configured with a zero value (through this value the call once established is maintained and not released).

```

Config>global-profiles dial

-- Dial Profiles Configuration --
Dial Profiles config>profile frprueba local-address 931234567
Dial Profiles config>profile frprueba remote-address 919876543
Dial Profiles config>list

DIAL PROFILE..: frprueba
Local Address.: 931234567
Remote Address: 919876543           Alternative Remote:
Permissions...: Outbound
Idle Time.....: 0
Shutdown Calls: Yes
Priority.....: Normal
Callback.....: None
ISDN Call type: Digital unrestricted data
ISDN Class....: 64 Kbps
Hold queue....: 0
3GPP Acc Ctrl.: None
3GPP APN.....: None
3GPP PDPTtype .: IP
3GPP CBST.....: 0,0,1
Call Retry....: Disabled
Call List.....: None

Dial Profiles config>exit
Config>

```

3.1.4 Configuring the base interface and the channel associated to the Generic FR Interface

Configure the profile you wish to use for this interface and the associated BRI ISDN base interface. The channel is set to 255 as the ISDN interface in this example is switched and therefore the channel is assigned by the Network during the call establishment process.

```

Config>network fr1

```



```
-- Generic FR User Configuration --
fr1 config>base-interface

-- Base Interface Configuration --
fr1 Base IFC config>base-interface bri0/0 255 profile frprueba
fr1 Base IFC config>list

      Base Interface      Profile Name      Base Circuit Id  Number of circuits
-----
      bri0/0      bri/0      frprueba      255      1

fr1 Base IFC config>exit
fr1 config>exit
Config>
```

3.1.5 Configuring the FR part of the Generic FR Interface

The FR part is configured in exactly the same way as an FR interface over a WAN line. In this example, we are going to configure PVC 16 and a protocol address (association between the destination IP address and DLCI).

```
Config>network fr1

-- Generic FR User Configuration --
fr1 config>fr

-- Frame Relay user configuration --
fr1 FR config>pvc 16 default
fr1 FR config>protocol-address 1.1.1.2 16
fr1 FR config>exit
fr1 config>exit
Config>
```

3.1.6 IP Configuration

Adds the Generic FR interface IP address (the rest of the configuration that the router may have has not been detailed).

```
Config>network fr1

-- Generic FR User Configuration --
fr1 config>ip address 1.1.1.1 255.0.0.0
fr1 config>exit
Config>
```

The configuration is now complete. This needs to be saved and the router restarted.

```
Config>save
Save configuration (Yes/No)? y

Building configuration as text... OK
Writing configuration... OK on Flash
Config>

*restart
Are you sure to restart the system(Yes/No)? y
  Done

Restarting. Please wait .....
```

In order to obtain the device configuration execute the SHOW CONFIG command:

```
Config>show config
; Showing System Configuration for access-level 15 ...

log-command-errors
no configuration
add device fr 1
set data-link x25 serial0/0
set data-link x25 serial0/1
set data-link x25 serial0/2
global-profiles dial
; -- Dial Profiles Configuration --
  profile frprueba default
  profile frprueba dialout
  profile frprueba remote-address 919876543
  profile frprueba local-address 931234567
;
exit
;
network fr1
; -- Generic FR User Configuration --
  ip address 1.1.1.1 255.0.0.0
;
  base-interface
; -- Base Interface Configuration --
  base-interface bri0/0 255 link
  base-interface bri0/0 255 profile frprueba
;
  exit
;
  fr
; -- Frame Relay user configuration --
  pvc 16 default
;
  protocol-address 1.1.1.2 16
  exit
;
exit
;
dump-command-errors
end
; --- end ---
Config>
```