



Dial Routing

Teldat-Dm 744-I

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Table of Contents

I	Related Documents.	1
Chapter 1	Introduction	2
1.1	Dial Routing Interface	2
1.2	Static Routes ID	2
1.3	Function	2
1.4	Configuring correctly	3
1.5	Configuration Procedure	3
1.5.1	Creating interfaces	3
1.5.2	Configuring the Dial Routing Interfaces	7
1.5.3	Configuring the AT Interfaces	12
1.5.4	Configuring the ISDN Interfaces (BRI)	12
1.5.5	Configuring the PPP Interfaces	13
1.5.6	Configuring IP	24
1.5.7	Adding ID static routes	26
1.5.8	Configuration Summary	26
Chapter 2	Configuration	31
2.1	Dial Routing Interface Configuration Commands	31
2.1.1	Configuring connections	31
2.1.2	Configuring the pool name	32
2.1.3	Configuring the quarantine time.	32
2.1.4	Configuring the IP address.	33
2.1.5	Displaying the configuration	33
2.1.6	Return to the previous menu	34
2.2	ID Static Routes Configuration Commands	34
2.2.1	Adding a static route with identifier	34
2.2.2	Deleting a static route with identifier	34
2.2.3	Listing configured ID routes	34
Chapter 3	Monitoring	36
3.1	Monitoring the Dial Routing Interface	36
3.1.1	? (HELP)	36
3.1.2	Displaying the monitoring information	36
3.1.3	Return to the previous menu	37
3.2	Monitoring the ID Static Routes.	38
3.2.1	Active routes Table	38
3.2.2	Calculating the next hop	39
3.2.3	Static routes Table	39

I Related Documents

Teldat-Dm 702-I TCP/IP

Teldat-Dm 705-I Generic Serial Interfaces

Teldat-Dm 710-I PPP Interface

Teldat-Dm 729-I BRI ISDN Interface

Teldat-Dm 772-I Common Configurations for Interfaces

Chapter 1 Introduction

1.1 Dial Routing Interface

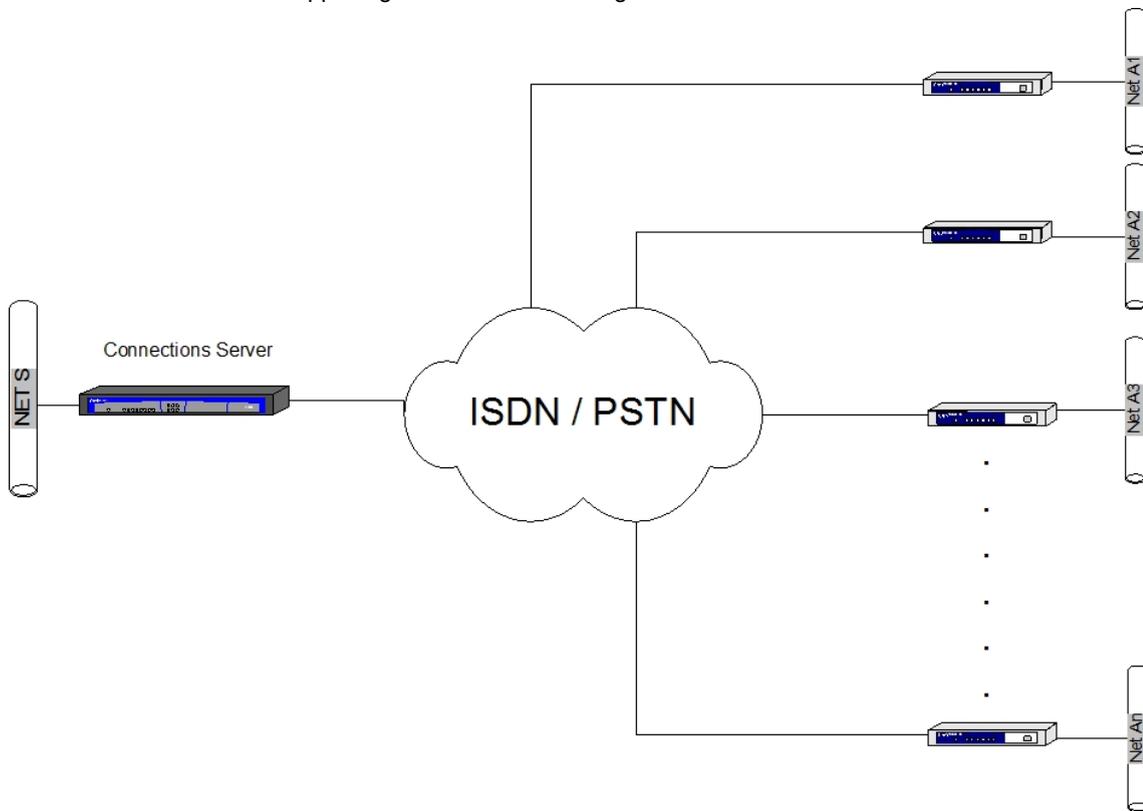
The *Dial Routing* interface is a virtual interface that distributes IP traffic via a pool of “Dial PPP” interfaces. A series of connections is defined in the configuration of the said interface such as the Dial PPP interfaces pool name. Each profile has an identifier (ID) which uniquely identifies this as well as a set of associated parameters (called number, user and password). Each Dial PPP interface can be registered in the pool through configuration. On enabling the *Dial Routing* facility, you need to introduce the pool name configured within the *Dial Routing* interface.

1.2 Static Routes ID

The static routes ID are static routes whose next hop is a *Dial Routing* interface with an extra parameter: the ID (profile identifier). By default, these routes have cost 3 assigned.

1.3 Function

Through the combination of the static routes ID and the *Dial Routing* interface, you can make the router act as a Dial PPP connections server. Supposing we have the following network:



In the connections server, you add as many routes ID as distinct BRANCHES networks that exist. In the example case, supposing we add a route to the LAN network of each branch (A1, A2An). If a device located in network S needs to address branch X LAN (AX), the IP packets exit with source S with destination AX, will reach the connections server in the first hop. In the initial state, assuming that an alternative lower cost route to the said destination network does not exist, the first IP packet uses the route ID. This packet will pass to the specified *Dial Routing* interface in the next route hop together with the ID. The *Dial Routing* interface will check if the said ID is in use and in contrary cases will search for a free PPP Dial interface among those that are registered. If one is found, this will reserve it, dynamically configured it with the ID profile parameters and will run over all the routes IDs whose next hop is the *Dial Routing* interface and whose ID is the past ID and will add for each of these a static route dynamically created with the same destination and mask, but with the next hop being the reserved Dial PPP interface and with cost 1. The rest of the IP packets will use the new static route. When the call is released due to release time without data or due to another cause, this dynamically created static route will disappear.

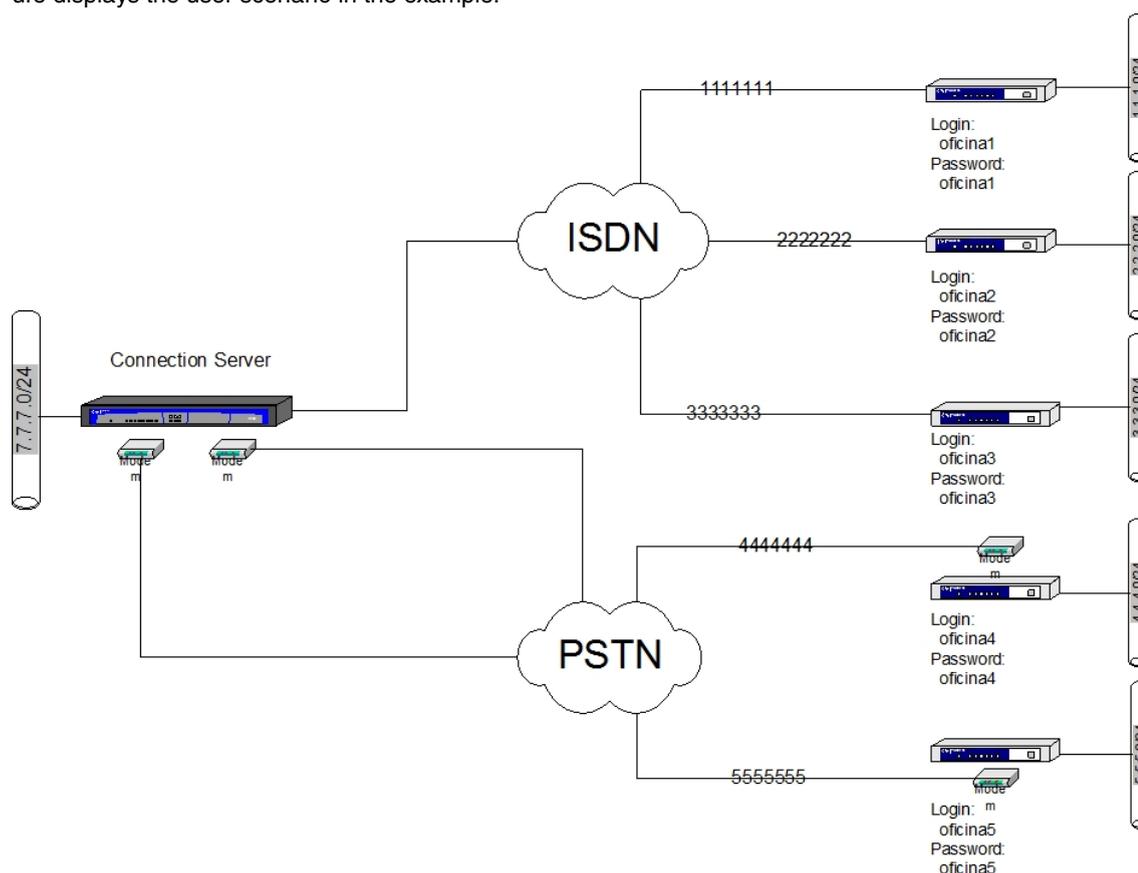
1.4 Configuring correctly

- Create as many PPP interfaces as B channels or modem connections you wish to reserve for the connections (you create as many simultaneous connections as you wish to have).
- Create the *Dial Routing* interface.
- From the *Dial Routing* interface configuration, add as many connections as existing destinations. Each profile is composed of a unique identifier, an ISDN telephone number, a login and a password; these parameters must be the parameters of the branch they represent.
- From the *Dial Routing* interface configuration, configure the connections pool name.
- From the configuration for each Dial PPP that you wish to participate in the pool, enable the *Dial Routing* facility and configure the same pool name as assigned in the previous step.
- Add unnumbered addresses to the PPP and *Dial Routing* interfaces. Configure the internal IP address. Enable IP Classless.
- Add static routes ID: destination and mask corresponding to the each branch's network, next hop the *Dial Routing* interface and ID corresponding to the profile associated to the said branch.
- If a determined branch has more than one network, you can configure as many routes ID (with the same ID) as distinct networks pertaining to the branch.

Configuration of the connections and the routes ID is dynamic: you do not need to restart the device.

1.5 Configuration Procedure

Below, you can see through an example, the sequence of steps required to establish an adequate configuration for a typical scenario where you need to access networks located through PSTN and ISDN connections. The following figure displays the user scenario in the example.



The steps required to carry out the configuration of the previous graphic connections server are as follows:

In this example, we start from the router default configuration, which will act as the connections server, however you can use any router that possesses this function.

1.5.1 Creating interfaces

The first step is to decide which interfaces are required for the said scenario:

- You need to configure as AT interfaces as many serial lines as simultaneous connections to PSTN destinations are required without surpassing the number of modems you have. Additionally you need to create a PPP interface for each AT interface. In the example we have two modems and assume that you wish to use both. Therefore, configure line 1 and 2 as AT interfaces and add two PPP interfaces that will operate over the said AT interfaces.
- You need to create as many PPP interfaces as simultaneous connections to ISDN destinations as required without surpassing the number of ISDN B channels you have available. In this example we have a BRI interface with two B channels and assume that both will be used in this scenario. Therefore create two more PPP interfaces to operate over the two BRI interface B channels. This does not mean that later we can't configure more connections (as we are going to do, as this is the objective of *dial-routing*), it's simply that we are limiting those that can be simultaneous to two.
- Additionally, you need to configure a *Dial Routing* interface that manages the PSTN connections and uses the PPP interfaces that operate over AT and another that manages the connections with ISDN destinations using the PPPs that are configured to operate over the BRI interface.

In short, you need to configure lines 1 and 2 as AT interfaces and add four PPP interfaces and two *Dial Routing*.

Below you can see the result of executing the SHOW CONFIG command with the aim of getting the device configuration in text mode. Further down the configuration of the interfaces is also shown so you can see which interfaces are already available and which ones require changes.

```
*config

Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
set data-link x25 serial0/0
set data-link x25 serial0/1
set data-link x25 serial0/2
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
  no ip address
;
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
  no ip address
;
exit
;
;
;
dump-command-errors
end
; --- end ---
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
Config>
```

As you can see the serial lines are in X.25 mode and therefore require changing. Additionally you do not have any PPP interfaces or *Dial Routing* which means these need to be added.

The following sequence of commands shows how to execute this operation. Firstly you need to add the PPP interfaces.

```

Config>add device ppp 1
Config>add device ppp 2
Config>add device ppp 3
Config>add device ppp 4
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
ppp1              ---         Generic PPP
ppp2              ---         Generic PPP
ppp3              ---         Generic PPP
ppp4              ---         Generic PPP
Config>

```

Subsequently, the *Dial Routing* interfaces are created.

```

Config>add device dial-routing 1
Config>add device dial-routing 2
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
ppp1              ---         Generic PPP
ppp2              ---         Generic PPP
ppp3              ---         Generic PPP
ppp4              ---         Generic PPP
dialroute1       ---         Dial Routing
dialroute2       ---         Dial Routing
Config>

```

And finally, change the serial lines configuration.

```

Config>set data-link at serial0/0
Config>set data-link at serial0/1
Config>list devices

Interface          Connector    Type of interface
ethernet0/0       LAN1        Fast Ethernet interface
serial0/0         SERIAL0/WAN1 AT COM
serial0/1         SERIAL1/WAN2 AT COM
serial0/2         SERIAL2/WAN3 X25
bri0/0           BRI/ISDN1   ISDN Basic Rate Int
x25-node          ---         Router->Node
ppp1              ---         Generic PPP
ppp2              ---         Generic PPP
ppp3              ---         Generic PPP
ppp4              ---         Generic PPP
dialroute1       ---         Dial Routing
dialroute2       ---         Dial Routing
Config>

```

Below you can see the results of the configuration, once the interfaces have been created, in text mode.

```

Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration

```

```
add device ppp 1
add device ppp 2
add device ppp 3
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0
set data-link at serial0/1
set data-link x25 serial0/2
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
    no ip address
;
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
    no ip address
;
exit
;
;
;
network pppl
; -- Generic PPP User Configuration --
    no ip address
;
exit
;
;
;
network ppp2
; -- Generic PPP User Configuration --
    no ip address
;
exit
;
;
;
network ppp3
; -- Generic PPP User Configuration --
    no ip address
;
exit
;
;
;
network ppp4
; -- Generic PPP User Configuration --
    no ip address
;
exit
;
;
;
network dialroutel
; -- DR interface configuration --
    no ip address
;
exit
;
;
;
```

```

network dialroute2
; -- DR interface configuration --
  no ip address
;
exit
;
;
;
dump-command-errors
end
; --- end ---
Config>

```

1.5.2 Configuring the Dial Routing Interfaces

Dial Routing interface configuration consists of two main steps.

The first step is to configure the name of the Pool corresponding to the interface. This pool name joins the interface with the PPP interfaces that can be used to carry out the connections. This must be the same as that configured when enabling *Dial Routing* in the PPP interfaces.

The second step is to configure the connection destinations that are going to be carried out through this interface.

There also exists the possibility of configuring a time period in which a PPP interface will remain in quarantine (i.e. without being used by the *Dial Routing*) when a local error occurs (failure to establish the physical level in the ISDN interface for example).

Below we will show how to configure the first two parameters which are vital. To see all the configuration possibilities, please see the section on configuration commands further on in this manual.

1.5.2.1 Configuring the Pool name

As already indicated, you need to configure a pool name that refers to the PPP interfaces in order to “register” these in a *Dial Routing* interface on starting up the device. The command used to configure this parameter is displayed below where we will configure “ISDN” as the pool name so the *Dial Routing* manages the ISDN connections and “PSTN” for managing connections via the modem.

```

Config>network dialroute1

-- DR interface configuration --
dialroute1 config>pool-name RDSI
dialroute1 config>list interface
Interface Configuration
-----
Pool Name:          RDSI
Quarantine time:   4 min.
dialroute1 config>exit
Config>network dialroute2
-- DR interface configuration --
dialroute2 config> pool-name RTC
dialroute2 config>list interface
Interface Configuration
-----
Pool Name:          RTC
Quarantine time:   4 min.
dialroute2 config>

```

The following list shows the router global configuration once this operation has been completed.

```

dialroute2 config>exit
Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
add device ppp 1
add device ppp 2
add device ppp 3

```

```
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0
set data-link at serial0/1
set data-link x25 serial0/2
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
  no ip address
;
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
  no ip address
;
exit
;
;
;
network ppp1
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network ppp2
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network ppp3
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network ppp4
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network dialroute1
; -- DR interface configuration --
  no ip address
;
  pool-name RDSI
;
exit
;
;
;
network dialroute2
```

```

; -- DR interface configuration --
  no ip address
;
  pool-name RTC
;
exit
;
;
;
dump-command-errors
end
; --- end ---
Config>

```

1.5.2.2 Configuring the destination connections

The second step is to configure the required parameters to connect to each of the possible destinations. For each destination you need to configure a telephone number, a user and a password which shape the profile for this destination.

In the following example, you have five connection destinations (as many connections as remote branches) with the following parameters:

- ISDN Destinations

Profile 1: telephone number 1111111, user oficina1 and password oficina1.

Profile 2: telephone number 2222222, user oficina2 and password oficina2

Profile 3: telephone number 3333333, user oficina3 and password oficina3

- PSTN Destinations

Profile 1: telephone number 4444444, user oficina4 and password oficina4

Profile 2: telephone number 5555555, user oficina5 and password oficina5

The ISDN destination connections are configured in the **dialroute1** interface which manages the ISDN connections and the PSTN destinations are configured in the **dialroute2** interface.

Below you can see all the commands required to carry out this configuration and the list of connections once created.

```

Config>network dialroute1

-- DR interface configuration --
dialroute1 config>connection 1 default
dialroute1 config>connection 1 destination-address 1111111
dialroute1 config>connection 1 username oficina1
dialroute1 config>connection 1 password oficina1
dialroute1 config>connection 2 default
dialroute1 config>connection 2 destination-address 2222222
dialroute1 config>connection 2 username oficina2
dialroute1 config>connection 2 password oficina2
dialroute1 config>connection 3 default
dialroute1 config>connection 3 destination-address 3333333
dialroute1 config>connection 3 username oficina3
dialroute1 config>connection 3 password oficina3
dialroute1 config>list connection
Connections
-----
ID          Destination Address  Username
-----
1  1111111             oficina1
2  2222222             oficina2
3  3333333             oficina3
dialroute1 config>exit
Config>network dialroute2

-- DR interface configuration --
dialroute2 config>connection 1 default

```

```
dialroute2 config>connection 1 destination-address 4444444
dialroute2 config>connection 1 username oficina4
dialroute2 config>connection 1 password oficina4
dialroute2 config>connection 2 default
dialroute2 config>connection 2 destination-address 5555555
dialroute2 config>connection 2 username oficina5
dialroute2 config>connection 2 password oficina5
dialroute2 config>list connection
Connections
-----
ID          Destination Address  Username
-----
          1  4444444             oficina4
          2  5555555             oficina5
dialroute2 config>
```

The following list shows the device global configuration once this operation has been executed.

```
dialroute2 config>exit
Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
add device ppp 1
add device ppp 2
add device ppp 3
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0
set data-link at serial0/1
set data-link x25 serial0/2
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
  no ip address
;
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
  no ip address
;
exit
;
;
;
network ppp1
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network ppp2
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
```

```
;
network ppp3
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network ppp4
; -- Generic PPP User Configuration --
  no ip address
;
exit
;
;
;
network dialroute1
; -- DR interface configuration --
  no ip address
;
  connection 1 default
  connection 1 destination-address 1111111
  connection 1 username oficina1
  connection 1 password oficina1
;
  connection 2 default
  connection 2 destination-address 2222222
  connection 2 username oficina2
  connection 2 password oficina2
;
  connection 3 default
  connection 3 destination-address 3333333
  connection 3 username oficina3
  connection 3 password oficina3
;
  pool-name RDSI
;
exit
;
;
;
network dialroute2
; -- DR interface configuration --
  no ip address
;
  connection 1 default
  connection 1 destination-address 4444444
  connection 1 username oficina4
  connection 1 password oficina4
;
  connection 2 default
  connection 2 destination-address 5555555
  connection 2 username oficina5
  connection 2 password oficina5
;
  pool-name RTC
;
exit
;
;
;
dump-command-errors
end
; --- end ---
Config>
```

1.5.3 Configuring the AT Interfaces

A possible next step would be to configure the AT interfaces so that the installed modems operate correctly. The necessary parameters are as follows:

- **Speed:** The possible speeds that can be configured are as follows: 2400, 4800, 9600, 19200, 38400, 57600 and 115200. We recommend configuring the speed immediately above the speed of your modem. I.e. if you have a 33.6K modem (33600), configure 38400; if you have a 56K modem then configure 57600 etc.
- **AT Commands:** AT commands configuration depends on your modem. The majority of the modems operate with the default configuration in the device. Please consult the manufacturers manual for the modem to find out which commands are valid for your modem.
- It is also very important to stress that the data bits must be 8 therefore the **Data bits** parameters should not be modified. It's also quite common for the **Parity** parameter to be set to **NONE** and the **Stop bits** to 1.

Subsequently, we will show the commands sequence in order to configure the speed and the AT commands. As you can see the default configuration has been respected, as it is perfectly valid for the modem in the example, however this serves as an example for the commands syntax.

```
Config>network 1

-- Interface AT. Configuration --
serial0/0 AT config>?
  additional-control-command    Set additional AT commands
  connection-mode              Set connection mode (Dial command or DTR)
  cts-control-command          Set AT command for CTS signal control
  data-bits                    Set number of bits per character
  dcd-control-command          Set AT command for DCD signal control
  description                  Enter interface description
  dial-mode                    Set dial mode (tone or pulse)
  disable                      Disable some features
  dsr-control-command          Set AT command for DSR signal control
  dtr-control-command          Set AT command for DTR signal control
  enable                       Enable some features
  flow-control-command         Set AT command for flow control
  frame-size                   Set frame size
  list                         List configuration
  no                           Set default config
  number-rings                 Set number of rings for auto answer
  parity                        Set character parity
  ring-tone-length             Set ring tone and silence lengths
  shutdown                     Change state to administratively down
  speed                        Set speed
  stop-bits                    Set number of stop bits per character
  update                       Update a level indicator
  v42-control-command          Set AT command for V.42 comp/error correction
  wait-time                    Set maximum connection time
  exit                         Return to previous menu
serial0/0 AT config>speed 57600
serial0/0 AT config>additional-control-command no-command
serial0/0 AT config>cts-control-command &R0
serial0/0 AT config>dcd-control-command &C1
serial0/0 AT config>dsr-control-command &S0
serial0/0 AT config>dtr-control-command &D2
serial0/0 AT config>v42-control-command &Q5
serial0/0 AT config>
```



Note

For further information on AT configuration, please consult manual Teldat-Dm705-I Generic Serial Interfaces.

1.5.4 Configuring the ISDN Interfaces (BRI)

Here we will begin to configure the ISDN base interface. Normally the device default configuration is adequate provided its base interface corresponds to the European standards. In this case we recommend that you do not modify any of the parameters.

For American standards, it will be necessary to at least configure the standard and the SPIDs of the two circuits. If you do not know these values, please consult your telecommunications operator.

In the following example, you can see how to configure these two parameters where the standard is configured to NI-1 which is the most common for American standards.

```
Config>network bri0/0

-- BRI ISDN Configuration --
bri0/0 BRI config>set circuit spid 1 9876543210100
bri0/0 BRI config>set circuit spid 2 9876543210101
bri0/0 BRI config>set global standard ni-1
bri0/0 BRI config>
```



Note

For further information on configuring the BRI interface, please consult manual Teldat-Dm729-I BRI ISDN Interface.

1.5.5 Configuring the PPP Interfaces

The configuration process continues with the configuration of the PPP interfaces. Firstly you need to create a dial profile or calls profile for the interfaces. Here you need to give permission in order to carry out outbound calls, as the purpose of *Dial Routing* is to be able to make calls to a number of destinations using a limited number of PPP interfaces. Additionally it is possible that you may want to receive calls. If you want all the interfaces to be able to receive calls you create a single dial profile used by all the interfaces. If you wish for only a few PPP links to receive calls (and therefore reserve the rest of the PPP interfaces to make calls only) then you will have to create a profile with inbound and outbound calls enabled and another profile with outbound calls only.

In the following commands sequence, you are shown how to create a dial profile. In the example we have assumed that all the profiles can both make and receive calls. Create a profile named DIALROUTING which will be used by all the PPP links.

```
Config>global-profiles dial

-- Dial Profiles Configuration --
Dial Profiles config>profile DIALROUTING default
Dial Profiles config>profile DIALROUTING inout
Dial Profiles config>profile DIALROUTING idle-time 70
Dial Profiles config>list

DIAL PROFILE..: DIALROUTING
Local Address.:
Remote Address:           Alternative Remote:
Permissions...: Inbound & Outbound
Idle Time.....: 70
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>
```

Subsequently, we are going to link the PPP interfaces with the base interface over which they will operate (BRI or AT depending on what suits). In the example, the ppp1 and ppp2 interfaces are configured to operate over ISDN and interfaces ppp3 and ppp4 to operate over serial lines 0 and 1 respectively.

```
Config>network ppp1

-- Generic PPP User Configuration --
```

```

ppp1 config>base-interface

-- Base Interface Configuration --
ppp1 Base IFC config>base-interface bri0/0 255 link
ppp1 Base IFC config>base-interface bri0/0 255 profile DIALROUTING
ppp1 Base IFC config>list

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

ppp1 Base IFC config>exit
ppp1 GenPPP config>exit
Config>network ppp2

-- Generic PPP User Configuration --
ppp2 GenPPP config>base-interface

-- Base Interface Configuration --
ppp2 Base IFC config>base-interface bri0/0 255 link
ppp2 Base IFC config>base-interface bri0/0 255 profile DIALROUTING
ppp2 Base IFC config>list

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

ppp2 Base IFC config>exit
ppp2 GenPPP config>exit
Config>network ppp3

-- Generic PPP User Configuration --
ppp3 GenPPP config>base-interface

-- Base Interface Configuration --
ppp3 Base IFC config>base-interface serial0/0 link
ppp3 Base IFC config>base-interface serial0/0 profile DIALROUTING
ppp3 Base IFC config>list

      Base Interface      Profile Name      Base Circuit Id  Number of circuits
-----
      serial0/0      at/0      DIALROUTING      1      1

ppp3 Base IFC config>exit
ppp3 GenPPP config>exit
Config>network ppp4

-- Generic PPP User Configuration --
ppp4 GenPPP config>base-interface

-- Base Interface Configuration --
ppp4 Base IFC config>base-interface serial0/1 link
ppp4 Base IFC config>base-interface serial0/1 profile DIALROUTING
ppp4 Base IFC config>list

      Base Interface      Profile Name      Base Circuit Id  Number of circuits
-----
      serial0/1      at/1      DIALROUTING      1      1

ppp4 Base IFC config>exit
ppp4 GenPPP config>exit
Config>

```

Consequently we need to create the configurations of PPP itself. First of all create the users. You need to create one user for the remote branch and another for the central.

```
Config>network ppp1

-- Generic PPP User Configuration --
ppp1 config>ppp

-- PPP Configuration --
ppp1 PPP config>authentication allowed-user oficinal password oficinal
ppp1 PPP config>authentication allowed-user oficina2 password oficina2
ppp1 PPP config>authentication allowed-user oficina3 password oficina3
ppp1 PPP config>authentication sent-user central password central
ppp1 PPP config>exit
ppp1 config>exit
Config>network ppp2

-- Generic PPP User Configuration --
ppp2 config>ppp

-- PPP Configuration --
ppp2 PPP config>authentication allowed-user oficinal password oficinal
ppp2 PPP config>authentication allowed-user oficina2 password oficina2
ppp2 PPP config>authentication allowed-user oficina3 password oficina3
ppp2 PPP config>authentication sent-user central password central
ppp2 PPP config>exit
ppp2 config>exit
Config>network ppp3

-- Generic PPP User Configuration --
ppp3 config>ppp

-- PPP Configuration --
ppp3 PPP config>authentication allowed-user oficina4 password oficina4
ppp3 PPP config>authentication allowed-user oficina5 password oficina5
ppp3 PPP config>authentication sent-user central password central
ppp3 PPP config>exit
ppp3 config>exit
Config>network ppp4

-- Generic PPP User Configuration --
ppp4 config>ppp

-- PPP Configuration --
ppp4 PPP config>authentication allowed-user oficina4 password oficina4
ppp4 PPP config>authentication allowed-user oficina5 password oficina5
ppp4 PPP config>authentication sent-user central password central
ppp4 PPP config>exit
ppp4 config>exit
Config>
```

Next, we need to enable CHAP authentication (i.e. this device demands that a PPP remote end authenticates through CHAP) and configure the *Dial Routing* pool name to which each PPP interface pertains to. Please note that it is essential that the pool name coincides with that configured in the corresponding *Dial Routing* interface.

```
Config>network ppp1

-- Generic PPP User Configuration --
ppp1 config>ppp

-- PPP Configuration --
ppp1 PPP config>authentication chap
ppp1 PPP config>dial-routing-pool RDSI
ppp1 PPP config>exit
ppp1 config>exit
Config>network ppp2

-- Generic PPP User Configuration --
```

```

Ppp2 config>ppp

-- PPP Configuration --
ppp2 PPP config>authentication chap
ppp2 PPP config>dial-routing-pool RDSI
ppp2 PPP config>exit
ppp2 config>exit
Config>network ppp3

-- Generic PPP User Configuration --
ppp3 config>ppp

-- PPP Configuration --
ppp3 PPP config>authentication chap
ppp3 PPP config>dial-routing-pool RTC
ppp3 PPP config>exit
ppp3 config>exit
Config>network ppp4

-- Generic PPP User Configuration --
ppp4 config>ppp

-- PPP Configuration --

ppp4 PPP config>authentication chap
ppp4 PPP config>dial-routing-pool RTC
ppp4 PPP config>exit
ppp4 config>exit

```

With this last step two types of PPP connections have been configured, one for the ISDN connections, which request CHAP authentication, accept users corresponding to branches 1, 2 and 3, is a member of the ISDN *Dial Routing* pool and authenticates with the “central” user. The second one is for PSTN connections which request CHAP authentication, accepts users corresponding to branches 4 and 5, is a member of the PSTN *Dial Routing* pool and authenticates with the “central” user.

The following list displays the device global configuration in text mode after these configuration adjustments have been made.

```

Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
add device ppp 1
add device ppp 2
add device ppp 3
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0
set data-link at serial0/1
set data-link x25 serial0/2
global-profiles dial
; -- Dial Profiles Configuration --
  profile DIALROUTING default
  profile DIALROUTING inout
  profile DIALROUTING idle-time 70
;
exit
;
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
  no ip address
;
exit

```

```
;
network bri0/0
; -- BRI ISDN Configuration --
  set circuit spid 1 9876543210100
  set circuit spid 2 9876543210101
  set global standard ni-1
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
  no ip address
;
exit
;
;
;
network pppl
; -- Generic PPP User Configuration --
  no ip address
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
  authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959
  authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
  authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
  dial-routing-pool RDSI
  exit
;
  base-interface
; -- Base Interface Configuration --
  base-interface bri0/0 255 link
  base-interface bri0/0 255 profile DIALROUTING
;
  exit
;
exit
;
;
;
network ppp2
; -- Generic PPP User Configuration --
  no ip address
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
  authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959
  authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
  authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
  dial-routing-pool RDSI
  exit
;
  base-interface
; -- Base Interface Configuration --
  base-interface bri0/0 255 link
  base-interface bri0/0 255 profile DIALROUTING
```

```
;
  exit
;
exit
;
;
;
network ppp3
; -- Generic PPP User Configuration --
  no ip address
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
  authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
  authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
  dial-routing-pool RTC
  exit
;
  base-interface
; -- Base Interface Configuration --
  base-interface serial0/0 link
  base-interface serial0/0 profile DIALROUTING
;
  exit
;
Exit
;
;
;
network ppp4
; -- Generic PPP User Configuration --
  no ip address
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
  authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
  authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
  dial-routing-pool RTC
  exit
;
  base-interface
; -- Base Interface Configuration --
  base-interface serial0/1 link
  base-interface serial0/1 profile DIALROUTING
;
  exit
;
exit
;
;
;
network dialroutel
; -- DR interface configuration --
  no ip address
;
  connection 1 default
  connection 1 destination-address 1111111
  connection 1 username oficial
  connection 1 password oficial
```

```

;
connection 2 default
connection 2 destination-address 2222222
connection 2 username oficina2
connection 2 password oficina2
;
connection 3 default
connection 3 destination-address 3333333
connection 3 username oficina3
connection 3 password oficina3
;
pool-name RDSI
;
exit
;
;
;
network dialroute2
; -- DR interface configuration --
no ip address
;
connection 1 default
connection 1 destination-address 4444444
connection 1 username oficina4
connection 1 password oficina4
;
connection 2 default
connection 2 destination-address 5555555
connection 2 username oficina5
connection 2 password oficina5
;
pool-name RTC
;
exit
;
;
;
dump-command-errors
end
; --- end ---
Config>

```

1.5.5.1 Configuring with multilink PPP

Sometimes occasions arise where you wish to connect to a remote device at a higher speed, using the two B channels from the ISDN base interface for example. In these cases, the PPP protocol permit various PPP links to be aggregated through a mechanism known as multilink PPP (MP). This facility can be used over any two PPP links. The most common use is that described above, to join two B channels and achieve a bandwidth of 128 Kbps. However it is also possible to carry out MP over two modem connections provided that both ends have two modem connections.

It is possible in the given scenario to make use of this mechanism to obtain wider bandwidth connections, however it is necessary to emphasis various aspects:

- A PPP is going to simultaneously use various channels; therefore the number of simultaneous connections is reduced. I.e. if we have two ISDN channels available and multilink can be carried out over them, when this facility is in use, you cannot access other remote devices.
- The destination telephone numbers must be the same for all the connections that are going to participate in the same MP link as, in the *Dial Routing* connections, only one telephone number can be configured.

Various variations can be proposed over the above scenario where multilink use can intervene. The simplest would be to permit all ISDN destinations for example to execute multilink. In this case you would only need to configure the involved PPP interfaces so that they can operate with multilink.

Another possible variation is where you only need to access some destinations with multilink. This latter configuration means you need to create another *Dial Routing* interface which handles the PPP that can carry out multilink, configure these PPP interfaces to operate with multilink and register the connections with destinations which you wish to access with multilink in this *Dial Routing* interface.

Below you can see the configuration process for the first of these scenarios.

The first step is to modify the base interfaces configuration which use the PPP over ISDN to permit the use of the two BRI channels. For this we need to execute the following sequence of commands.

```
Config>network ppp1

-- Generic PPP User Configuration --
ppp1 config>base-interface

-- Base Interface Configuration --
ppp1 Base IFC config>base-interface bri0/0 255 number-of-circuits 2

ppp1 Base IFC config>list

      Base Interface      Profile Name      Base Circuit Id      Number of circuits
-----
      bri0/0      bri/0      DIALROUTING      255      2

ppp1 Base IFC config>exit
ppp1 config>exit
Config>network ppp2

-- Generic PPP User Configuration --
ppp2 config>base-interface

-- Base Interface Configuration --
ppp2 Base IFC config>base-interface bri0/0 255 number-of-circuits 2
ppp2 Base IFC config>list

      Base Interface      Profile Name      Base Circuit Id      Number of circuits
-----
      bri0/0      bri/0      DIALROUTING      255      2

ppp2 Base IFC config>
```

Subsequently, we need to configure the multilink parameters in the PPP interfaces that are going to operate with multilink. **We strongly recommend enabling the option that only permits you to add new links to the multilink if the PPP has been initiated from our side.** In addition to the basic parameters (enable multilink and the option to add links in outgoing calls only), you can configure the following:

- *Activation Interval*: This is the period of time that the traffic load on the line must remain above the activation threshold so a new link is added.
- *Deactivation Interval*: This is the period of time that the traffic load on the line must remain below the activation threshold so a link is released.
- *Activation Threshold*: This is the previously mentioned activation threshold.
- *Deactivation Threshold*: This is the previously mentioned deactivation threshold.
- *Traffic Load*: This is the direction of the traffic taken into account in order to calculate the amount of traffic on the line (inbound, outbound or both).
- *Max Links per Bundle*: Maximum number of links that can be added to the same multilink.

We recommend that the remaining parameters take their default values.

```
Config>network ppp1

-- Generic PPP User Configuration --
ppp1 config>ppp

-- PPP Configuration --
ppp1 PPP config>multilink enable
ppp1 PPP config>multilink call-out
ppp1 PPP config>multilink activation interval 60
ppp1 PPP config>multilink activation threshold 80
ppp1 PPP config>multilink deactivation interval 90
ppp1 PPP config>multilink deactivation threshold 25
ppp1 PPP config>exit
ppp1 config>exit
Config>network ppp2
```

```

-- Generic PPP User Configuration --
ppp2 config>ppp

-- PPP Configuration --
ppp2 PPP config>multilink enable
ppp2 PPP config>multilink call-out
ppp2 PPP config>multilink activation interval 60
ppp2 PPP config>multilink activation threshold 80
ppp2 PPP config>multilink deactivation interval 90
ppp2 PPP config>multilink deactivation threshold 25
ppp2 PPP config>exit
ppp2 config>exit
Config>

```

In this example, a multilink has been configured. This will attempt to add a new link if the line traffic load remains above 80% of the accumulated bandwidth during 60 consecutive seconds and will attempt to eliminate the link if the traffic load remains below 25% of the said bandwidth during 90 seconds taking into account both inbound and outbound traffic. Please note that the percentage of traffic is taken over the whole of the bandwidth that the multilink currently has enabled. I.e. if there is a single PPP over ISDN, the activation level will be 51.2 Kbps (80% of 64 Kbps) and when there are two links, the deactivation threshold is 32 Kbps (25% of 128 Kbps). We recommend that these calculations be made when configuring. You need to make sure that you do not configure an activation time threshold below the deactivation time, contrariwise the result will be the constant adding and eliminating of links.

The command that displays the configuration in text mode provides the following result:

```

Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
add device ppp 1
add device ppp 2
add device ppp 3
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0
set data-link at serial0/1
set data-link x25 serial0/2
global-profiles dial
; -- Dial Profiles Configuration --
  profile DIALROUTING default
  profile DIALROUTING inout
  profile DIALROUTING idle-time 70
;
exit
;
;
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
  no ip address
;
exit
;
network bri0/0
; -- BRI ISDN Configuration --
  set circuit spid 1 9876543210100
  set circuit spid 2 9876543210101
  set global standard ni-1
exit
;
;
;
network x25-node
; -- X25-node interface configuration --

```

```

no ip address
;
exit
;
;
;
network ppp1
; -- Generic PPP User Configuration --
no ip address
;
ppp
; -- PPP Configuration --
authentication chap
authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959
authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
dial-routing-pool RDSI
multilink enable
multilink activation interval 1m
multilink activation threshold 80
multilink deactivation interval 1m30s
multilink deactivation threshold 25
multilink call-out
exit
;
base-interface
; -- Base Interface Configuration --
base-interface bri0/0 255 link
base-interface bri0/0 255 profile DIALROUTING
base-interface bri0/0 255 number-of-circuits 2
;
exit
;
exit
;
;
;
network ppp2
; -- Generic PPP User Configuration --
no ip address
;
ppp
; -- PPP Configuration --
authentication chap
authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959
authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
dial-routing-pool RDSI
multilink enable
multilink activation interval 1m
multilink activation threshold 80
multilink deactivation interval 1m30s
multilink deactivation threshold 25
multilink call-out
exit
;
base-interface
; -- Base Interface Configuration --
base-interface bri0/0 255 link

```

```
base-interface bri0/0 255 profile DIALROUTING
base-interface bri0/0 255 number-of-circuits 2
;
exit
;
exit
;
;
;
network ppp3
; -- Generic PPP User Configuration --
no ip address
;
ppp
; -- PPP Configuration --
authentication chap
authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
dial-routing-pool RTC
exit
;
base-interface
; -- Base Interface Configuration --
base-interface serial0/0 link
base-interface serial0/0 profile DIALROUTING
;
exit
;
exit
;
;
;
network ppp4
; -- Generic PPP User Configuration --
no ip address
;
ppp
; -- PPP Configuration --
authentication chap
authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
dial-routing-pool RTC
exit
;
base-interface
; -- Base Interface Configuration --
base-interface serial0/1 link
base-interface serial0/1 profile DIALROUTING
;
exit
;
exit
;
;
;
network dialroutel
; -- DR interface configuration --
no ip address
;
connection 1 default
connection 1 destination-address 1111111
```

```

connection 1 username oficinal
connection 1 password oficinal
;
connection 2 default
connection 2 destination-address 2222222
connection 2 username oficina2
connection 2 password oficina2
;
connection 3 default
connection 3 destination-address 3333333
connection 3 username oficina3
connection 3 password oficina3
;
pool-name RDSI
;
exit
;
;
;
network dialroute2
; -- DR interface configuration --
no ip address
;
connection 1 default
connection 1 destination-address 4444444
connection 1 username oficina4
connection 1 password oficina4
;
connection 2 default
connection 2 destination-address 5555555
connection 2 username oficina5
connection 2 password oficina5
;
pool-name RTC
;
exit
;
;
;
dump-command-errors
end
; --- end ---
Config>

```



Note

For further information on configuring PPP, please see manual Teldat-Dm710-I PPP Interface.

1.5.6 Configuring IP

Once you have configured everything relating to the interfaces, you need to configure the IP protocol.

1.5.6.1 Configuring IP addresses

Configure the Ethernet IP address and the internal IP address is set to coincide with the said address.

```

Config>network ethernet0/0

-- Ethernet Interface User Configuration --
ethernet0/0 config>ip address 7.7.7.7 255.255.255.0
ethernet0/0 config>exit
Config>protocol ip

-- Internet protocol user configuration --
IP config>internal-ip-address 7.7.7.7
IP config>list addresses

```

```

IP addresses for each interface:
ethernet0/0      7.7.7.7          255.255.255.0   NETWORK broadcast, fill 0
serial0/0
serial0/1
serial0/2
bri0/0
x25-node
ppp1
ppp2
ppp3
ppp4
dialroute1
dialroute2
IP disabled on this ifc
Internal IP address: 7.7.7.7
IP config>exit
Config>

```

The PPP and *Dial Routing* interfaces are configured as unnumbered.

```

Config>network ppp1

-- Generic PPP User Configuration --
ppp1 config>ip address unnumbered
ppp1 config>exit
Config>network ppp2

-- Generic PPP User Configuration --
ppp2 config>ip address unnumbered
ppp2 config>exit
Config>network ppp3

-- Generic PPP User Configuration --
ppp3 config>ip address unnumbered
ppp3 config>exit
Config>network ppp4

-- Generic PPP User Configuration --
ppp4 config>ip address unnumbered
ppp4 config>exit
Config>network dialroute1

-- DR interface configuration --
dialroute1 config>ip address unnumbered
dialroute1 config>exit
Config>network dialroute2

-- DR interface configuration --
Dialroute2 config>ip address unnumbered
Dialroute2 config>exit
Config>protocol ip

-- Internet protocol user configuration --
IP config>list addresses
IP addresses for each interface:
ethernet0/0      7.7.7.7          255.255.255.0   NETWORK broadcast, fill 0
serial0/0
serial0/1
serial0/2
bri0/0
x25-node
ppp1             unnumbered      0.0.0.0         NETWORK broadcast, fill 0
ppp2             unnumbered      0.0.0.0         NETWORK broadcast, fill 0
ppp3             unnumbered      0.0.0.0         NETWORK broadcast, fill 0
ppp4             unnumbered      0.0.0.0         NETWORK broadcast, fill 0
dialroute1      unnumbered      0.0.0.0         NETWORK broadcast, fill 0
dialroute2      unnumbered      0.0.0.0         NETWORK broadcast, fill 0
Internal IP address: 7.7.7.7
IP config>

```

1.5.6.2 Enabling Ip Classless

```
IP config>classless
IP config>list ip-protocol
Directed broadcasts: enabled
RIP: disabled
OSPF: disabled
Multipath: disabled
Ip classless: enabled
Icmp redirects: enabled
Icmp unreachable: enabled
IP config>
```

1.5.7 Adding ID static routes

This last step configures the routes with identifier which link the IP destinations with the *Dial Routing* interfaces connections. To do this a route to the destination address/subnet is created with the gateway being the *Dial Routing* interface used for access together with the identifier corresponding to the *Dial Routing* connection. This connection should be used to connect to the device providing access to the said network.

In this example, a route with identifier has been created for branch 1 towards network 1.1.1.0, with mask 255.255.255.0, whose gateway is the dialroute1 interface and whose identifier is 1, as this is the connection created with the parameters to access branch 1. A similar process is carried out with the rest of the branches and the result is shown below:

```
IP config>id-route 1.1.1.0 255.255.255.0 dialroute1 1
IP config>id-route 2.2.2.0 255.255.255.0 dialroute1 2
IP config>id-route 3.3.3.0 255.255.255.0 dialroute1 3
IP config>id-route 4.4.4.0 255.255.255.0 dialroute2 4
IP config>id-route 5.5.5.0 255.255.255.0 dialroute2 5
IP config>
```



Note

For further information on configuring IP, please see manual Teldat-Dm702-I TCP/IP.

1.5.8 Configuration Summary

Lastly, we are going to display the definitive device global configuration in text mode for our scenario. This configuration can be used as a base to carry out any required modifications and to send the resulting commands sequence to the device in order to obtain the required configuration. **This configuration does not include the multilink configuration.**

```
Config>show config
; Showing System Configuration for access-level 15 ...
; ATLAS Router 2 156 Version 10.7.0

log-command-errors
no configuration
add device ppp 1
add device ppp 2
add device ppp 3
add device ppp 4
add device dial-routing 1
add device dial-routing 2
set data-link at serial0/0
set data-link at serial0/1
set data-link x25 serial0/2
global-profiles dial
; -- Dial Profiles Configuration --
  profile DIALROUTING default
  profile DIALROUTING inout
  profile DIALROUTING idle-time 70
;
exit
;
```

```
;
network ethernet0/0
; -- Ethernet Interface User Configuration --
  ip address 7.7.7.7 255.255.255.0
;
;
;
;
exit
;
network bri0/0
; -- BRI ISDN Configuration --
  set circuit spid 1 9876543210100
  set circuit spid 2 9876543210101
  set global standard ni-1
exit
;
;
;
network x25-node
; -- X25-node interface configuration --
  no ip address
;
exit
;
;
network pppl
; -- Generic PPP User Configuration --
  ip address unnumbered
;
;
;
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
  authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959
  authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
  authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
  dial-routing-pool RDSI
  exit
;
  base-interface
; -- Base Interface Configuration --
  base-interface bri0/0 255 link
  base-interface bri0/0 255 profile DIALROUTING
;
  exit
;
exit
;
;
network ppp2
; -- Generic PPP User Configuration --
  ip address unnumbered
;
;
;
;
  ppp
; -- PPP Configuration --
  authentication chap
  authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
```

```

        authentication allowed-user oficinal ciphered-pwd 0xA3CBFC7A4DF0079F9E8519
D7C927D959
        authentication allowed-user oficina2 ciphered-pwd 0xA3CBFC7A4DF0079F325527
6956674D84
        authentication allowed-user oficina3 ciphered-pwd 0xA3CBFC7A4DF0079F8C3F64
C7DCE0E903
        dial-routing-pool RDSI
        exit
;
base-interface
; -- Base Interface Configuration --
        base-interface bri0/0 255 link
        base-interface bri0/0 255 profile DIALROUTING
;
        exit
;
exit
;
;
network ppp3
; -- Generic PPP User Configuration --
        ip address unnumbered
;
;
;
        ppp
; -- PPP Configuration --
        authentication chap
        authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
        authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
        authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
        dial-routing-pool RTC
        exit
;
base-interface
; -- Base Interface Configuration --
        base-interface serial0/0 link
        base-interface serial0/0 profile DIALROUTING
;
        exit
;
exit
;
;
network ppp4
; -- Generic PPP User Configuration --
        ip address unnumbered
;
;
;
        ppp
; -- PPP Configuration --
        authentication chap
        authentication sent-user central ciphered-pwd 0xEA4416D1735E168E
        authentication allowed-user oficina4 ciphered-pwd 0xA3CBFC7A4DF0079FD654B4
0C2E5C57DC
        authentication allowed-user oficina5 ciphered-pwd 0xA3CBFC7A4DF0079FA12F34
101943C3D1
        dial-routing-pool RTC
        exit
;
base-interface
; -- Base Interface Configuration --

```

```
base-interface serial0/1 link
base-interface serial0/1 profile DIALROUTING
;
exit
;
exit
;
;
network dialroute1
; -- DR interface configuration --
ip address unnumbered
;
;
;
connection 1 default
connection 1 destination-address 1111111
connection 1 username oficinal
connection 1 password oficinal
;
connection 2 default
connection 2 destination-address 2222222
connection 2 username oficina2
connection 2 password oficina2
;
connection 3 default
connection 3 destination-address 3333333
connection 3 username oficina3
connection 3 password oficina3
;
pool-name RDSI
;
exit
;
;
network dialroute2
; -- DR interface configuration --
ip address unnumbered
;
;
;
connection 1 default
connection 1 destination-address 4444444
connection 1 username oficina4
connection 1 password oficina4
;
connection 2 default
connection 2 destination-address 5555555
connection 2 username oficina5
connection 2 password oficina5
;
pool-name RTC
;
exit
;
protocol ip
; -- Internet protocol user configuration --
internal-ip-address 7.7.7.7
classless
id-route 1.1.1.0 255.255.255.0 dialroute1 1
id-route 2.2.2.0 255.255.255.0 dialroute1 2
id-route 3.3.3.0 255.255.255.0 dialroute1 3
id-route 4.4.4.0 255.255.255.0 dialroute2 4
id-route 5.5.5.0 255.255.255.0 dialroute2 5
;
exit
```

```
;
;
dump-command-errors
end
; --- end ---
Config>
```

Chapter 2 Configuration

2.1 Dial Routing Interface Configuration Commands

This section describes all the commands to configure the *Dial Routing* interface. In order to access the configuration environment for the said interface, you need to proceed as for the rest of the device interfaces, through the **NET-WORK** command in the device configuration followed by the interface identifier:

```
*config
Config> network dialroute1
-- DR interface configuration --
dialroute1 config>
```

There are certain 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).

The following table shows the specific commands for this *Dial Routing* interface:

Command	Function
? (HELP)	Lists the commands or their options.
CONNECTION	Configures a connection.
LIST	Lists the current configuration.
NO	Negates a command or establishes its default value.
POOL-NAME	Configures the pool name.
QUARANTINE-TIME	Configures the quarantine time.
EXIT	Returns to the previous prompt.

2.1.1 Configuring connections

2.1.1.1 Adding a new connection

In order to add a new connection, use the **CONNECTION** command.

```
dialroute1 config>connection <id> default
```

This command creates a connection with the default values for the distinct parameters. The way to modify the parameter values will be explained further on in this manual.

The <id> parameter is a number that uniquely identifies the connection. This connection identifier must be distinct to already existing connections. Contrariwise, the command will modify the previously configured connection parameters that have the said identifier.

Additionally, this identifier serves to link the connection with the IP destination accessed through the said connection. For this, the ID static route identifier must coincide with the *Dial Routing* connection identifier that provides access to the subnet specifying this route.

2.1.1.2 Modifying connection parameters

Once the connection has been created, in order to assign parameter values or change the previously assigned value use the **CONNECTION** command with the different permitted options.

2.1.1.2.1 Modifying the destination telephone number

```
dialroute1 config>connection <id> destination-address <telephone number>
```

2.1.1.2.2 Modifying the user

```
dialroute1 config>connection <id> username <name>
```

2.1.1.2.3 Modifying the password

```
dialroute1 config>connection <id> password <password>
```

2.1.1.3 Deleting a connection

This command is used to delete a connection and is displayed below.

```
dialroute1 config>no connection <id>
```

2.1.1.4 Example of a connection configuration

First of all, create the connection:

```
dialroute1 config>connection 5 default
```

Secondly, assign the values to the different parameters:

```
dialroute1 config>connection 5 destination-address 918076565
dialroute1 config>connection 5 username usuariol
dialroute1 config>connection 5 password passwordl
dialroute1 config>list connection
Connections
-----
ID          Destination Address  Username
-----
          5  918076565          usuariol
dialroute1 config>
```

It may be necessary to change the value of a parameter that was incorrectly introduced. E.g. if its necessary to enter a 0 before the telephone number in order to access the external line, the command is as follows:

```
dialroute1 config>connection 5 destination-address 0918076565
dialroute1 config>list connection
Connections
-----
ID          Destination Address  Username
-----
          5  0918076565          usuariol
dialroute1 config>
```

Lastly, when you wish to delete a connection, enter:

```
dialroute1 config>no connection 5
dialroute1 config>list connection
No connections found.
dialroute1 config>
```

2.1.2 Configuring the pool name

The connections pool name is used to link the *Dial Routing* interface with the PPP interfaces which are used to establish the connections. For this, on enabling *Dial Routing* in the corresponding PPP interfaces you must configure the same profile name as configured here.

To configure the PPP links pool name that will use this interface, use the following command:

```
dialroute1 config>pool-name <pool-name>
```

Example:

```
dialroute1 config>pool-name POOL1
dialroute1 config>
```

2.1.3 Configuring the quarantine time

When a PPP interface suffers a local source error detectable only when you try and carry out a connection (ISDN cable disconnection for example), a mechanism is used to avoid the situation where successive connections unsuccessfully try to use this interface. This mechanism places the interface in “quarantine” during a determined period of time during which the *Dial Routing* will not use the said PPP link. The duration time of this quarantine period is configurable through the command given below.

```
dialroute1 config>quarantine-time <number of minutes>
```

Example:

```
dialroute1 config>quarantine-time ?
<2..60>    Quarantine time (minutes)
dialroute1 config>quarantine-time 4
dialroute1 config>
```

2.1.4 Configuring the IP address

Use the following command to add an IP address to the interface, which is common to all IP interfaces:

```
dialroute1 config>ip address { <dirección_IP> | unnumbered }
```

Example:

If you wish to configure an IP address for the *Dial Routing* interface as unnumbered, enter the following:

```
dialroute1 config>ip address unnumbered
dialroute1 config>
```



Note

For further information on configuring IP, please see manual Teldat-Dm 702-I TCP/IP Configuration.

2.1.5 Displaying the configuration

2.1.5.1 Listing the configuration common to all connections

In order to list the configuration affecting all the connections, use the following command:

```
dialroute1 config>list interface
```

Example:

```
dialroute1 config>list interface
Interface Configuration
-----
Pool Name:          POOL1
Quarantine time:    4 min.
dialroute1 config>
```

2.1.5.2 Listing specific connection parameters

In order to list the configured connections, use the following command:

```
dialroute1 config>list connection
```

Example:

```
dialroute1 config>list connection
Connections
-----
ID          Destination Address  Username
-----
1  918076565          USUARIO1@teldat
dialroute1 config>
```

2.1.5.3 Listing all the configuration

In order to list the whole of the configuration for this interface, execute the command given below:

```
dialroute1 config>list all
```

Example:

```
dialroute1 config>list all
Interface Configuration
-----
```

```

Pool Name:          POOL1
Quarantine time:   4 min.

Connections
-----

ID          Destination Address  Username
-----
1          918076565             USUARIO1@teldat
dialroute1 config>

```

2.1.6 Return to the previous menu

In order to exit the interface configuration menu and to return to the device main configuration menu, use the command shown below which is the same in the entire device configuration.

```
dialroute1 config>exit
```

Example:

```
dialroute1 config>exit
Config>
```

2.2 ID Static Routes Configuration Commands

In this section, all the commands to configure the ID static routes are described. In order to access the configuration environment for the said routes, access the IP configuration menu introducing the following commands:

```
*config

Config>protocol ip

-- Internet protocol user configuration --
IP config>
```

2.2.1 Adding a static route with identifier

In order to add an ID static route, enter the following command:

```
IP config>id-route <dest> <mask> <next-gw> <id>
```

The parameters are, in this order, destination network, destination mask, next hop and identifier.

In the next hop parameter, you need to introduce the *Dial Routing* interface name which contains the connection to reach the said destination network.

Example:

```
IP config>id-route 2.2.2.2 255.255.255.255 dialroute1 25
IP config>
```

2.2.2 Deleting a static route with identifier

To delete an ID static route, enter the following command:

```
IP config>no id-route <dest> <mask> <next-gw>
```

These parameters, in this order, are: destination network, destination mask and next hop.

Example:

```
IP config>no id-route 2.2.2.2 255.255.255.255 dialroute1
IP config>
```

2.2.3 Listing configured ID routes

In order to list the configured static routes use the following command.

Syntax:

```
IP config>list routes
```

**Note**

The ID routes are those in the list that begin with “ID Route...”. The rest are normal static routes.

Example:

```
IP config>list routes

route to 0.0.0.0,0.0.0.0 via 192.168.1.1, cost 1
ID route to 5.5.5.5,255.255.255.255 via dialroute1, Id 5
ID route to 3.3.3.3,255.255.255.255 via dialroute1, Id 3
ID route to 1.1.1.1,255.255.255.255 via dialroute1, Id 1
ID route to 192.80.0.120,255.255.255.255 via dialroute2, Id 2
IP config>
```

**Note**

For further information on IP configuration, please see manual Teldat-Dm702-I TCP/IP Configuration.

Chapter 3 Monitoring

3.1 Monitoring the Dial Routing Interface

This section describes the commands used to monitor the state of the *Dial Routing* interface links and connections. To access this monitoring, introduce the following commands:

```
*monitor
Console Operator
+network <interface_name>
-- Interface <interface_name> Console --
DR monitor+
```

Example:

```
*monitor
Console Operator
+network dialroutel
-- Interface dialroutel Console --
DR monitor+
```

The following commands are available in the interface console:

Command	Function
? (AYUDA)	Lists the commands or their options.
LIST	Displays the <i>Dial Routing</i> interface monitoring information.
EXIT	Exits the interface monitoring console.

3.1.1 ? (HELP)

Use the ? (**HELP**) command to list the commands available at the layer where the router is monitoring. You can also use this command after a specific command to list its options.

Syntax:

```
DR monitor+?
```

Example:

```
DR monitor+?
list    Show monitoring information
exit
DR monitor+
```

3.1.2 Displaying the monitoring information

Once you have selected the **LIST** command, you can see the available options by using the help command:

```
DR monitor+list ?
all          Information about links and connections
connections  Status of the Dial Routing connections
links        State of the participating PPP interfaces
DR monitor+
```

3.1.2.1 Monitoring information completed

To list both the state of the PPP interfaces participating in the *Dial Routing* process, as well as the status of the *Dial Routing* connections in an interface, use the following command:

Syntax:

```
DR monitor+list all
```

Example:

```
DR monitor+list all
```

```

Links status
-----
PPP Interface      Status                Connection ID
-----
ppp1               IDLE
ppp2               IDLE

Connections status
-----
Connection Id     Destination address   Username                Status
-----
1                 918076565            USUARIO1@teldat        INACTIVE
DR monitor+

```

3.1.2.2 Connection Status

To list the status of the *Dial Routing* connections in an interface, use the following command:

Syntax:

```
DR monitor+list connections
```

Example:

```

DR monitor+list connections
Connections status
-----
Connection Id     Destination address   Username                Status
-----
1                 918076565            USUARIO1@teldat        INACTIVE
DR monitor+

```

A list is displayed with an entry for each connection profile where you can see the identifier, the destination telephone number, the user name and if this is being used by a link or not.

3.1.2.3 Link information

To list the state of the PPP interfaces that participate in the *Dial Routing* process directed by this interface, use the following command:

Syntax:

```
DR monitor+list links
```

Example:

```

DR monitor+list links
Links status
-----
PPP Interface      Status                Connection ID
-----
ppp1               IDLE
ppp2               IDLE
DR monitor+

```

This list contains an entry for each PPP interface that can be used by this Dial Route interface to carry out a connection. The *Status* field indicates if the interface is active or available. In cases where it is active, the *Connection ID* field indicates the identifier of the connection you are using.

In cases where the link list contains less interfaces than expected, check the pool name configuration both in the *Dial Routing* interface and the PPP interfaces.

3.1.3 Return to the previous menu

The **EXIT** command exits the interface monitoring menu.

Syntax:

```
DR monitor+exit
```

Example:

```
DR monitor+exit
+
```

3.2 Monitoring the ID Static Routes

In this section, the commands used to monitor the ID static routes are described. In order to access the monitoring menu for these routes, introduce the following commands:

```
*monitor
Console Operator
+protocol ip
IP+
```

The following table summarizes the ID static routes monitoring commands.

Command	Function
<i>DUMP-ROUTING-TABLE</i>	Lists the active routes table.
<i>ROUTE-GIVEN-ADDRESS</i>	Lists the next hop to a determined destination.
<i>STATIC-ROUTES</i>	Lists the static routes table.
<i>EXIT</i>	Returns to the previous prompt.

3.2.1 Active routes Table

The **DUMP-ROUTING-TABLE** command displays the active routes table:

Syntax:

```
IP+dump-routing-table
```

Example:

```
IP+dump-routing-table
Type                Dest net/Mask  Cost Age  Next hop(s)

Stat(1) [0]         0.0.0.0/0    [ 60/1 ] 0   192.168.1.1 (ethernet0/0)
Sbnt(0) [0]         1.0.0.0/8    [240/1 ] 0   None

                    Stat(1) [0] 1.1.1.0/24 [ 60/3 ] 0 dialroute1
Sbnt(0) [0]         2.0.0.0/8    [240/1 ] 0   None

                    Stat(1) [0] 2.2.2.0/24 [ 60/3 ] 0 dialroute1
Sbnt(0) [0]         3.0.0.0/8    [240/1 ] 0   None

                    Stat(1) [0] 3.3.3.0/24 [ 60/3 ] 0 dialroute1
Sbnt(0) [0]         4.0.0.0/8    [240/1 ] 0   None

                    Stat(1) [0] 4.4.4.0/24 [ 60/3 ] 0 dialroute2
Sbnt(0) [0]         5.0.0.0/8    [240/1 ] 0   None

                    Stat(1) [0] 5.5.5.0/24 [ 60/3 ] 0 dialroute2
Sbnt(0) [0]         7.0.0.0/8    [240/1 ] 0   None
Dir(0) [1]          7.7.7.0/24   [ 0/1 ] 0   ethernet0/0
Dir(0) [1]          7.7.7.7/32   [ 0/1 ] 0   snk
Dir(0) [1]          192.168.1.0/24 [ 0/1 ] 0   ethernet0/0

Default gateway in use.
Type Cost Age  Next hop
Stat 1 0 192.168.1.1 (ethernet0/0)

Routing table size: 768 nets (64512 bytes), 15 nets known, 15 shown
IP+
```

The ID static routes are those that are shown in bold. These differ from the rest of the static routes in the next hop (dialrouteX), apart from that they are identical.

3.2.2 Calculating the next hop

The **ROUTE-GIVEN-ADDRESS** command displays the next hop to a determined destination.

Syntax:

```
IP+route-given-address <dest>
```

Example:

```
IP+route-given-address 1.1.1.1
Destination: 1.1.1.0
Mask: 255.255.255.0
Route type: Stat
Distance: 3
Tag: 0
Next hop(s): 1.1.1.1 (dialroute1 ) Age: 0
IP+
```

If the next hop to access a determined destination is a *Dial Routing* interface, “dialrouteX” will appear in the “Next hop”:

3.2.3 Static routes Table

The **STATIC-ROUTES** command displays the configured static routes table:

Syntax:

```
IP+static-routes
```

Example:

```
IP+static-routes
Flags: A added to routing table, R refresh, T track up
Type Net Cost Next_hop Int Circuit State
---- ---
CNFG 0.0.0.0/0 1 192.168.1.1 ethernet0/0 N/A Ar
CNFG 1.1.1.0/24 3 dialroute1 dialroute1 1 Ar
CNFG 2.2.2.0/24 3 dialroute1 dialroute1 2 Ar
CNFG 3.3.3.0/24 3 dialroute1 dialroute1 3 Ar
CNFG 4.4.4.0/24 3 dialroute2 dialroute2 4 Ar
CNFG 5.5.5.0/24 3 dialroute2 dialroute2 5 Ar
IP+
```

The ID static routes are highlighted in bold. These differ from the rest in the next hop (dialroute X) and in the circuit: the configured ID.