Generic HDLC Interface

Teldat-Dm 774-I

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Chapter 1 Introduction

1.1 Introducing the HDLC interface

The **Teldat Routers** generic HDLC interface provides a standard HDLC encapsulation mechanism, synchronous, orientated to bit over serial lines, using framing characters and adding checksum.

An HDLC frame is made up of an address field, control and fixed length protocol and by one variable length field that contains the user data. The following figure displays the frame format.

Octet	8	7	6	5	4	3	2	1
1	HDLC Flag = 0x7e							
2	Address (1 octet)							
2	Control (1 octet)							
3-4	Protocol (2 octets)							
	User data							
	Frame check sequence (FCS) = 16 bits (2 octets)							
N	HDLC Flag = 0x7E							

Fig. 1: HDLC frame format

1.1.1 HDLC flags

These are the first and last octets and indicate the beginning and end of the frame.

1.1.2 Address

Specifies the type of packet:

0x8F: Multicast: Maintenance packet.

0x0F: Unicast: Data packet.

1.1.3 Control

Always set to 0.

1.1.4 Protocol

Specifies the type of data contained in the information field. Normally this is an Ethernet protocol and has the following values:

0x0800 IP.

0x0806 ARP.

0x86DD IPv6.

1.1.5 User data

This field contains the protocol packet to be transmitted.

1.1.6 Frame check sequence (FCS)

This field is the standard 16 bit CRC (*Cyclic Redundancy Check*) normally used in HDLC and LAPD frames. Its task is to detect errors in the frame bits that are between the beginning flag and the frame check sequence (FCS).

Chapter 2 Configuration

2.1 Configuration Commands

This chapter describes the Generic HDLC interface configuration commands and is divided into the following sections:

- Aggregating an HDLC interface.
- Displaying the HDLC configuration prompt.
- HDLC configuration commands.

2.2 Aggregating an HDLC interface

The way to add a generic HDLC interface is as follows:

- Add the HDLC device. To do this, use the **ADD DEVICE HDLC** <**interface_id**> from the main configuration menu.

```
*config

Config>add device hldc X
Config>list devices
Interface           Connector      Type of interface
ethernet0/0         LAN1           Fast Ethernet interface
serial0/0           SERIAL0/WAN1   Auto Install Interface
serial0/1           SERIAL1/WAN2   X25
serial0/2           SERIAL2/WAN3   X25
bri0/0              BRI/ISDN1      ISDN Basic Rate Int
x25-node            ---            Router->Node
hdlcx               ---            Generic HDLC encapsulation
Config>
```

- Associate a base interface to the HDLC. If you want the HDLC interface to establish over a serial line, you need to have previously configure the serial line for the device you wish to use as a synchronous interface (SYNC):

```
Config>set data-link sync serialX/X

Config>network hdlcX
-- Generic HDLC Encapsulation User Configuration -
hdlcX config>base-interface
-- Base Interface Configuration --
hdlcX Base IFC config>base-interface serialX/X link
hdlcX Base IFC config>
```

Another possibility is to configure HDLC over BRI ISDN:

```
Config>network hdlcX

-- Generic HDLC Encapsulation User Configuration -
hdlcX config>base-interface
-- Base Interface Configuration --
hdlcX Base IFC config>base-interface briX/X <circuit_id> {link | profile <profile_name>}
hdlcX Base IFC config>
```

You can also configure HDLC over channels (time-slots) or groups of G.703 interface channels.

```
Config>network hdlcX

-- Generic HDLC Encapsulation User Configuration -
hdlcX config>base-interface
-- Base Interface Configuration --
hdlcX Base IFC config>base-interface g703X/X <circuit_id> link
hdlcX Base IFC config>
```

- If the interface is HDLC over BRI ISDN and the ISDN channels are switched (i.e. the link is established through calls), you also need to create a call profile to control the connection. The call profile contains data such as what type of calls are permitted, where the outgoing calls go to, what incoming calls are permitted, what the idle time is,

etc. For further information on call profiles, please see manual Teldat-Dm 732-I Dial Profiles.

2.3 Displaying the HDLC configuration prompt

To access the HDLC configuration environment, carry out the following steps:

(1)   At the GESTCON (*) prompt, enter **PROCESS 4** (or **P4**), or **CONFIG**.

(2)   At the configuration prompt (Config>), enter **NETWORK** <**interface_name**>, where the **interface_name** is the name of the interface where HDLC is going to run.

(3)   To configure the specific HDLC parameters, simply use one of the commands described in this chapter. These are available from the HDLC configuration menu. To access this menu once within the interface configuration, enter the **HDLC** command to enter the menu corresponding to these specified parameters.

```
*config

Config>network hdlcX
-- Generic HDLC Encapsulation User Configuration --
hdlcX config>?
  base-interface    Access the base interface configuration menu
  bfd               Interface Bidirectional Forwarding Detection config commands
  description       Enter interface description
  hdlc              Takes you to the hdlc encapsulation configuration prompt
  ip                Interface Internet Protocol config commands
  ipv6              Interface Internet Protocol version 6 config commands
  load-interval     Specify interval for load calculation for an interface
  mtu               Set the interface maximum transmit unit
  no                Negates a command or sets its defaults
  service-policy    Configure QoS Service Policy
  shutdown          Change state to administratively down
  update            Update a level indicator
  exit
hdlcX config>hdlc

-- HDLC encapsulator user configuration --
hdlcX HDLC config>
```

Command history:

Release	Modification
11.0.1.1.2	
11.0.3	**IPv6** option added. The IPv6 protocol is already supported on HDLC interfaces.

There are certain commands common to all the device's interfaces. These commands are described in the common configuration interfaces (Teldat-Dm 772-I Common Configuration Interfaces).

2.4 Configuring HDLC

This section describes the HDLC interface configuration commands.

Command	Function
? (HELP)	Permits you to view the available commands or options within a command.
KEEPALIVE	Configures the maintenance timer value.
LIST	Lists the options configuration for the interface.
NO	Configures the default value for a determined option.
EXIT	Returns to the *hdlcx config>* configuration prompt.

2.4.1 ? (HELP)

You can use the **?** (HELP) command to list all the valid commands at the level where the router is configured. This command can also be used after a specific command to list the options this has available.

Syntax:

```
hdlcX HDLC config>?
```

Example:

```
hdlcX HDLC config>?
  keepalive    Sets the keepalive timer value
  list         Display Interface Configuration
  no
  exit
hdlcX HDLC config>
```

2.4.2 KEEPALIVE

Permits you to configure the time interval where the maintenance frames from the interface are transmitted and evaluated. *(10 # Default value).*

To disable the Keepalive, use the NO command described in this manual.

So the HDLC interface functions correctly, the Keepalive value must be identical at both ends. There is no value negotiation in the configuration consequently it is essential that both values are the same.

If three keepalives are transmitted and a response is not received from the other end, the interface is declared DOWN.

Syntax:

```
hdlcX HDLC config>keepalive ?
  <1..65535>    Sets the keepalive timer value
```

Example:

```
hdlcX HDLC config> keepalive 15
hdlcX HDLC config>
```

2.4.3 LIST

Displays the current configuration of the interface's configurable parameters.

Example:

```
hdlcX HDLC config>list
Keepalive timer value .... 10
MTU size ................. 2048
hdlcX HDLC config>
```

2.4.4 NO

Permits you to disable the keepalive timer.

Example:

```
hdlcX HDLC config>no ?
  keepalive    Disables the keepalive timer
hdlcX HDLC config>no keepalive
hdlcX HDLC config>list
Keepalive timer value .... 0
MTU size ................. 2048
hdlcX HDLC config>
```

2.4.5 EXIT

By using the EXIT command, you exit the HDLC interface configuration menu and return to the main configuration menu for the HDLC interface *config>*.

Syntax:

```
hdlcX HDLC config>exit
```

Example:

```
hdlcX HDLC config>exit
hdlcX config>
```

Chapter 3 Monitoring

3.1 Monitoring the Interface

Strictly speaking, this interface does not have monitoring commands.

To view the summarized information on the status of the HDLC interface, you need to enter the **DEVICE** command from the monitoring prompt (+) and then indicate the HDLC interface number.

Example:

```
+device


                           Auto-test   Auto-test      Maintenance
Interface           CSR    Vect     valids    failures        failures
ethernet0/0     FA200E00     27          1           0               0
serial0/0       FA200A00     5e          0          80               0
serial0/1       FA200A20     5d          0         239               0
serial0/2       FA200A60     5b          0         239               0
bri0/0          FA200A40     5c          0           0               0
x25-node               0      0          1           0               0
hdlc1                  0      0          0           8               0
+
+device hdlc1


                           Auto-test   Auto-test      Maintenance
Interface           CSR    Vect     valids    failures        failures
hdlc1                  0      0          0           9               0

base interface is serial0/0
base interface state is down
protocol state is down
keepalive is 10
  myseq:    0
  mineseen: 0
  yourseen: 0


+
```

The meaning of each of the fields is as follows:

Interface	Type of interface and index.
CSR	Address for the control/status/data registers.
Vect	Interruption vector associated to the interface.
Auto-test valids	Number of successful Auto-tests. This does not update for BRI ISDN interfaces.
Auto-test failures	Number of failed Auto-tests.This does not update for BRI ISDN interfaces.
Maintenance failures	Number of maintenance failures. This does not update for BRI ISDN interfaces.
Keepalive	Maintenance timer value
myseq	Maintenance sequence number to be sent.
mineseen	Maintenance sequence number expected at the remote end.
yourseen	Maintenance sequence number received from the remote end.