Teldat Router

SDLC Protocol

Doc. *DM506-I* Rev. *8.30*

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Chapter 1
Introduction

1. The SDLC Protocol

SDLC configuration commands are available at the *SDLC # Config>* prompt, where # identifies the interface you specify with the **NETWORK** command. Changes made to the **Teldat Router** configuration do not take effect immediately, but become part of the router's non volatile configuration memory when the router restarts.

Conversely, SDLC monitoring commands entered within the SDLC monitoring module take effect immediately. However, changes made with monitoring command *do not* become part of the router's non volatile configuration.

When the **Teldat Router** restarts, the configuration stored in non-volatile configuration memory replaces the effects of monitoring commands.

Monitoring consists of these actions:

- Monitoring the protocols, and network interfaces currently in use by the router.
- Making real time changes to the SDLC configuration without permanently affecting the router's non volatile configuration memory.
- Displaying ELS (Event Logging System) messages relating to router activities and performance.

WARNING!

The SDLC Interface currently DOES NOT support the secondary mode function.

Chapter 2
Configuration

1. Configuration Commands

To enter the configuration process, follow the next steps:

1. At the prompt (*), enter **PROCESS 4** or just **P 4**. This brings you to the *Config>* prompt.

```
*P 4
Config>
```

If the *Config>* prompt does not appear immediately, press *enter* again.

2. Next, enter the **NETWORK** command, plus the number of an SDLC interface configured earlier.

```
Config> NETWORK #
SDLC # Config>
```

If, for example, the interface is number 3, the screen should look like this:

```
Config> NETWORK 3
SDLC 3 Config>
```

Command	Function
? (HELP)	List the configuration commands or lists any parameters associated with that command.
ADD	Adds an SDLC remote-secondary station.
DELETE	Removes an SDLC remote-secondary station.
DISABLE	Prevents connections to an SDLC link station.
ENABLE	Allows connections to an SDLC link station.
LIST	Displays configured information for an SDLC link station.
SET	Configures specific interface and remote-secondary information.
EXIT	Exits the SDLC configuration environment.

1.1. ? (HELP)

Use the **?** (HELP) command to list the available commands that are available from the current prompt level. You can also enter a **?** after a specific command name to list its options.

Syntax:

```
SDLC # Config> ?
```

Example:

```
SDLC # Config> ?
ADD
DELETE
DISABLE
ENABLE
LIST
SET
EXIT
SDLC # Config>
```

1.2. ADD

Use the **ADD** command to add a remote-secondary end station. You may elect not to use this command, the router will, by default, add a remote-secondary end station to ensure proper operation of the SDLC interface. However, you must use this command if you wish to mix T2.0 and T2.1 link stations on the same multipoint line. The router is considered the primary end station by default.

Syntax:

```
SDLC # Config> ADD ?
REMOTE-SECONDARY
```

Example:

```
SDLC # Config> ADD REMOTE-SECONDARY
Enter station address (in hex) [C1]?
Enter remote station name [SDLC_C1]?
Enter max packet size [2048]?
Enter receive window [7]?
Enter transmit window [7]?
Enable negotiable mode (Yes/No)?
SDLC # Config>
```

The meaning of each field is:

Enter station address The remote station's SDLC address in the range 01-FE.

Enter remote station name The name designation of the SDLC station (maximum characters is 8)

Enter max packet size	The maximum packet size that can be sent to or received from the remote link station. This value cannot be greater than that specified for the link with the **SET LINK FRAME-SIZE** command.
Enter receive window	The maximum number of packets that the router can transmit without sending a response.
Enter transmit window	The maximum number of packets that the router can transmit without receiving a response.
Enable negotiable mode	Indicates whether the remote-secondary end station you are adding will be a negotiable (T2.1) or secondary (T2.0) node on the multipoint line.

1.3. DELETE

Use the **DELETE** command to remove the specified remote-secondary end station (remote station name or address) from the SDLC configuration.

By default the router is considered the primary end station.

Syntax:

```
SDLC # Config> DELETE ?
REMOTE-SECONDARY <name> |<address>
```

Example:

```
SDLC # Config> DELETE REMOTE-SECONDARY C1
SDLC # Config>
```

1.4. DISABLE

Use the **DISABLE** command to prevent connections from being created with a SDLC link station.

Syntax:

```
SDLC # Config> DISABLE ?
LINK
REMOTE-SECONDARY
```

a) *DISABLE LINK*

Prevents the establishment of SDLC sessions on any SDLC link stations on the interface.

Example:

```
SDLC # Config> DISABLE LINK
SDLC # Config>
```

b) *DISABLE REMOTE-SECONDARY <name> | <address>*

Prevents the establishment of an SDLC session to the specified remote-secondary end station (remote station name or address).

Example:

```
SDLC # Config> DISABLE REMOTE-SECONDARY C1
SDLC # Config>
```

1.5. ENABLE

Use the **ENABLE** command to enable connections to remote SDLC link stations.

Syntax:

```
SDLC # Config> ENABLE ?
LINK
REMOTE-SECONDARY
```

a) *ENABLE LINK*

Allows subsystems in the router (e.g. DLSw) to use SDLC's facilities.

Example:

```
SDLC # Config> ENABLE LINK
SDLC # Config>
```

b) *ENABLE REMOTE-SECONDARY <name> | <address>*

Allow connections to the specified remote-secondary end station (link station name).

Example:

```
SDLC # Config> ENABLE REMOTE-SECONDARY C1
SDLC # Config>
```

1.6. LIST

Use the **LIST** command in the SDLC configuration process to display configuration information on one or all SDLC link stations.

Syntax:

```
SDLC # Config> LIST ?
LINK
REMOTE-SECONDARY
```

a) LIST LINK

Displays information for the SDLC interface.

Example:

```
SDLC # Config> LIST LINK
Link configuration for:     LINK_1  (Enabled)

Default role:  PRIMARY     Type:          POINT-TO-POINT
Duplex:        FULL        Modulo:        8
Idle state:    FLAG        Encoding:      NRZ
Clocking:      INTERNAL    Frame size:    2048
Speed:         64000       Cable:         DCE

Timers:   XID/TEST response:   0.5 sec
          SNRM response:       2.0 sec
          Poll response:       0.5 sec
          Inter-poll delay:    0.2 sec
          RTS hold delay:      DISABLED
          Inter-frame delay:   DISABLED

Counters:    XID/TEST retry    4
             SNRM retry        6
             Poll retry        10
SDLC # Config>
```

The meaning of each field is:

Link configuration — The name and status of SDLC link stations in the router's configuration.

Default role — The link role used for link stations created with a default configuration. You can change this role using the add remote-secondary command.

Type — The type of link, either Multipoint or Point to point.

Duplex	Duplex configuration, HALF or FULL.
Modulo	The sequence number range to use on the link: MOD 8 (0-7) o MOD 128 (0-127).
Idle state	The bit pattern (FLAG or MARK) transmitted on the line when the interface is not transmitting data.
Encoding	Configures the SDLC transmission encoding scheme as NRZ (Non-Return to Zero) or NRZI (Non-Return to Zero Inverted).
Clocking	Interface clocking, either external or internal.
Frame size	The maximum frame size that can be sent over the interface.
Speed	Link speed expressed in bits/secs when the clock is internal.
Cable	Type of behavior at a physical level. The values are DTE and DCE and only serve for information effects as they depend of the physical driver installed or the cable used.
Timers	All the timers listed below have a 100ms resolution.
XID/TEST response	The time the router waits for an XID or TEST response message before re-transmitting the XID or TEST frame. A value of 0 indicates that the router continues to retry indefinitely.
SNRM response	The maximum time the router waits for a UA response message before the station retransmits SNRM (E).
Poll response	The maximum time to wait for a response from any polled station before retrying.
Inter-poll delay	The amount of time the router (configured with a primary role) waits after receiving a response, before polling the next station.
RTS hold delay	The amount of time that the primary router waits before dropping RTS low after the transmission of a frame. This parameter is specific to half-duplex operation.
Inter-frame delay	The minimum amount of time (in 5.12 microsecond time units) that the primary router waits between transmitting frames.

Counters:

XID/TEST retry — The maximum number of times the router sends a XID or TEST frame without receiving a response before timing out. A value of 0 indicates that the router continues to retry indefinitely.

SNRM retry — The maximum number of times the router will send an SNRM (E) frame without receiving a response before timing out. A value of 0 indicates that the router will continue to retry indefinitely.

Poll retry — The maximum number of times the router polls the station without receiving a response before timing out. A value of 0 indicates that the router continues to retry indefinitely.

b) *LIST REMOTE-SECONDARY <name> | <address> | ALL*

Displays information for the specified SDLC link station on the interface, or for all link stations.

Example:

```
SDLC # Config> LIST REMOTE-SECONDARY C1
Address Name    Status   Max BTU  Rx Window  Tx Window  Role
------- -----   -------  -------  ---------  ---------- ----------
C1      SDLC_C1 ENABLED  2048     7          7          NEGOTIABLE
SDLC # Config>
```

Example:

```
SDLC # Config> LIST REMOTE-SECONDARY ALL
Address  Name      Status    Max BTU  Rx Window   Tx Window  Role
-------  -------   -------   -------  ---------  ----------  ----------
C1       SDLC_C1   ENABLED   2048     7           7          NEGOTIABLE
C2       SDLC_C2   ENABLED   2048     7           7          NEGOTIABLE
C3       SDLC_C3   ENABLED   2048     7           7          SECONDARY
SDLC # Config>
```

The meaning of each field is:

Address. — The address of the SDLC link station.

Name — The name of the SDLC link station.

Status — The status of the SDLC link station, ENABLED or DISABLED.

Max BTU The frame size limit of the remote station. It must not be larger than the maximum Basic Transmission Unit (BTU) packet size configured with the set link frame-size command. The default is 521 bytes.

Rx Window The size of the receive window.

Tx Window The size of the transmit window.

Role The role of the remote link station, either SECONDARY (Type 2.0) or NEGOTIABLE (Type 2.1).

1.7. SET

Use the **SET** command in the SDLC configuration process to configure specific information for one or all SDLC link stations. All time values are in seconds, with a 0.1 second resolution.

Syntax:

```
SDLC # Config> SET ?
LINK
REMOTE-SECONDARY
```

a) SET LINK

Syntax:

```
SDLC # Config> SET LINK ?
DUPLEX
ENCODING
FRAME-SIZE
IDLE
INTER-FRAME
MODULO
NAME
POLL
ROLE
RTS-HOLD
SNRM
SPEED
TYPE
XID/TEST
```

- *SET LINK DUPLEX*

Syntax:

```
SDLC # Config> SET LINK DUPLEX ?
FULL
HALF
```

SET LINK DUPLEX FULL

Configures the SDLC line for full-duplex or half-duplex.

Example:

```
SDLC # Config> SET LINK DUPLEX FULL
SDLC # Config>
```

SET LINK DUPLEX HALF

Configures the SDLC line for half-duplex.

Example:

```
SDLC # Config> SET LINK DUPLEX HALF
SDLC # Config>
```

- *SET LINK ENCODING*

Syntax:

```
SDLC # Config> SET LINK ENCODING ?
NRZ
NRZI
```

SET LINK ENCODING NRZ

Configures the SDLC transmission encoding scheme as NRZ (Non-Return to Zero). NRZ is the default.

Example:

```
SDLC # Config> SET LINK ENCODING NRZ
SDLC # Config>
```

SET LINK ENCODING NRZI

Configures the SDLC transmission encoding scheme as NRZI (Non-Return to Zero Inverted). NRZ is the default.

Example:

```
SDLC # Config> SET LINK ENCODING NRZI
SDLC # Config>
```

- *SET LINK FRAME-SIZE*

Syntax:

```
SDLC # Config> SET LINK FRAME-SIZE
```

Configures the maximum size of the frames that can be transmitted and received on the data link. The valid entries are 576 to 18,000. The default is 2,048.

The remote-secondary max packet value cannot be greater than the value of the link frame-size. If this occurs, the router automatically resets this value equal to that set for the link, and generates an ELS message warning the user that the remote secondary max packet value has been changed.

Example:

```
SDLC # Config> SET LINK FRAME-SIZE
Frame size in bytes (576 - 18000) [2048] ?
SDLC # Config>
```

- *SET LINK IDLE*

Syntax:

```
SDLC # Config> SET LINK IDLE ?
FLAG
MARK
```

SET LINK IDLE FLAG

Configures the transmit idle state for SDLC framing. The default is the flag option which provides continuous flags (7E hex) between frames.

Example:

```
SDLC # Config> SET LINK IDLE FLAG
SDLC # Config>
```

SET LINK IDLE MARK

Configures the transmit idle state for SDLC framing. The mark option sends 1's between frames.

Example:

```
SDLC # Config> SET LINK IDLE MARK
SDLC # Config>
```

- *SET LINK INTER-FRAME*

Syntax:

```
SDLC # Config> SET LINK INTER-FRAME
```

Allows the insertion of a delay between transmitted frames. The command guarantees a minimum delay between frames so making them compatible with older and slower serial devices at the other end.
This value is passed in 5.12 microseconds units.

Example:

```
SDLC # Config> SET LINK INTER-FRAME
Transmit Delay [0]?
SDLC # Config>
```

- *SET LINK MODULO*

Syntax:

```
SDLC # Config> SET LINK MODULO
```

Specifies the sequence number range to use on the link: MODULO 8 (0-7) or MODULO 128 (0-127). The default is 8.

> ***Note: When you change this value, the transmit and receive window sizes become invalid.***

Use the set remote-secondary command to change the receive-window and transmit-window sizes. Valid window sizes for MODULO 8 are 0 to 7; valid window sizes for MODULO 128 are 8 to 127.

At connection start-up, a SNRME (rather than a SNRM) and extended SDLC frame headers are used.

Example:

```
SDLC # Config> SET LINK MODULO 8
SDLC # Config>
```

- *SET LINK NAME*

Syntax:

```
SDLC # Config> SET LINK NAME
```

Establishes a name for the link that you are configuring. This parameter is for informational purposes only.

Example:

```
SDLC # Config> SET LINK NAME
Enter link name:  [LINK_1]?
SDLC # Config>
```

- *SET LINK POLL*

Syntax:

```
SDLC # Config> SET LINK POLL ?
DELAY
RETRY
TIMEOUT
```

SET LINK POLL DELAY

Configures the time delay between each poll that is sent over the interface.

Example:

```
SDLC # Config> SET LINK POLL DELAY
Enter delay between polls [0.2]?
SDLC # Config>
```

SET LINK POLL RETRY

Configures the number of times the interface retries to poll the remote SDLC link station before it decides the link station is down and closes the connection.

Example:

```
SDLC # Config> SET LINK POLL RETRY
Enter poll retry count (0 = forever) [10]?
SDLC # Config>
```

SET LINK POLL TIMEOUT

Configures the amount of time the router waits for a poll response before timing out.

Example:

```
SDLC # Config> SET LINK POLL TIMEOUT
Enter poll timeout [0.5]?
SDLC # Config>
```

- *SET LINK ROLE*

Syntax:

```
SDLC # Config> SET LINK ROLE ?
NEGOTIABLE
PRIMARY
```

Configures the interface as an SDLC primary link station (default).

> ***Note: The SDLC interface negotiates only to primary. It does not negotiate to secondary.***

SET LINK ROLE NEGOTIABLE

Configures the interface as a negotiable SDLC link station.

Example:

```
SDLC # Config> SET LINK ROLE NEGOTIABLE
SDLC # Config>
```

SET LINK ROLE PRIMARY

Configures the interface as a primary SDLC link station.

Example:

```
SDLC # Config> SET LINK ROLE PRIMARY
SDLC # Config>
```

- *SET LINK RTS-HOLD*

Syntax:

```
SDLC # Config> SET LINK RTS-HOLD
```

The time to hold RTS high after transmitting a frame. This setting is for half-duplex mode. This setting has no effect in full-duplex mode.

Example:

```
SDLC # Config> SET LINK RTS-HOLD
Enter RTS hold duration after transmit complete [0.0]?
 SDLC # Config>
```

- *SET LINK SNRM*

Syntax:

```
SDLC # Config> SET LINK SNRM ?
RETRY
TIMEOUT
SDLC # Config>
```

SET LINK SNRM RETRY

Configures the number of times an SNRM (E) is re transmitted without receiving a response before giving up.

Example:

```
SDLC # Config> SET LINK SNRM RETRY
Enter SNRM retry count (0 = forever)[6]?
SDLC # Config>
```

SET LINK SNRM TIMEOUT

Configures the time to wait for an UA response before re transmitting an SNRM (E).

Example:

```
SDLC # Config> SET LINK SNRM TIMEOUT
Enter SNRM response timeout [2.0]?
SDLC # Config>
```

- *SET LINK SPEED*

Syntax:

```
SDLC # Config> SET LINK SPEED
```

For internal clocking, this command specifies the speed of the transmit and receive clock lines. The range is 0 to 64 Kbps.

Example:

```
SDLC # Config> SET LINK SPEED
Internal Clock Speed [64000]?
SDLC # Config>
```

- *SET LINK TYPE*

Syntax:

```
SDLC # Config> SET LINK TYPE ?
MULTIPOINT
POINT-TO-POINT
```

SET LINK TYPE MULTIPOINT

Configures the SDLC link as a multipoint link.

Example:

```
SDLC # Config> SET LINK TYPE MULTIPOINT
SDLC # Config>
```

SET LINK TYPE POIN-TO-POINT

Configures the SDLC link as a point to point link.

Example:

```
SDLC # Config> SET LINK TYPE POINT-TO-POINT
SDLC # Config>
```

- *SET LINK XID/TEST*

Syntax:

```
SDLC # Config> SET LINK XID/TEST ?
RETRY
TIMEOUT
```

SET LINK XID/TEST RETRY

Configures the maximum number of times an XID or TEST frame is resent before giving up.

Example:

```
SDLC # Config> SET LINK XID/TEST RETRY
Enter XID and TEST retry count (0 = forever) [5]?
SDLC # Config>
```

SET LINK XID/TEST TIMEOUT

Configures the maximum amount of time to wait for an XID or TEST frame response.

Example:

```
SDLC # Config> SET LINK XID/TEST TIMEOUT
Enter XID and TEST frame response timeout [2.0]?
SDLC # Config>
```

b) SET REMOTE-SECONDARY

Syntax:

```
SDLC # Config> SET REMOTE-SECONDARY <name> | <address> ?
ADDRESS
MAX-PACKET
NAME
RECEIVE-WINDOW
ROLE
TRANSMIT-WINDOW
SDLC # Config>
```

- *SET REMOTE-SECONDARY <name> / <address> ADDRESS*

Changes the remote station's SDLC address in the range 01 to FE.

Example:

```
SDLC # Config> SET REMOTE C1 ADDRESS
Enter station address (in hex) [C1]?
SDLC # Config>
```

- *SET REMOTE-SECONDARY <name> / <address> MAX-PACKET*

The maximum size of the packet that a remote-secondary station can receive. The default size is 521 bytes.

Note that you cannot set the maximum packet size larger than the link frame size configured with the SET LINK FRAME-SIZE command. If you do this, the router automatically resets the max packet size to the link frame size, and issues the following message:

SDLC.054: nt 3 SDLC/0 Stn c4 - MaxBTU too large for link - adjusted (4.096-2.048)

Example:

```
SDLC # Config> SET REMOTE-SECONDARY C1 MAX-PACKET
Enter max packet size [2048]?
SDLC # Config>
```

- *SET REMOTE-SECONDARY <name> / <address> NAME*

This command changes the name of a remote SDLC station. A maximum of 8 characters is permitted.

Example:

```
SDLC # Config> SET REMOTE-SECONDARY C1 NAME
Enter remote station name [SDLC_1]?
SDLC # Config>
```

- *SET REMOTE-SECONDARY <name> / <address> RECEIVE-WINDOW*

The maximum number of frames that the router can receive before sending a response.

Example:

```
SDLC # Config> SET REMOTE-SECONDARY C1 RECEIVE-WINDOW
Enter receive window [7]?
SDLC # Config>
```

- *SET REMOTE-SECONDARY <name> / <address> ROLE*

Changes the role of the remote-secondary SDLC station, possible values are SECONDARY and NEGOTIABLE.

Example:

```
SDLC # Config> SET REMOTE-SECONDARY C1 ROLE ?
NEGOTIABLE
SECONDARY
SDLC # Config>
```

- *SET REMOTE-SECONDARY <name> / <address> TRANSMIT-WINDOW*

The maximum number of frames the router can transmit before receiving a response frame.

Example:

```
SDLC # Config> SET REMOTE-SECONDARY C1 TRANSMIT-WINDOW
Enter transmit window [7]?
SDLC # Config>
```

1.8. EXIT

Use the **EXIT** command to return to the previous prompt level.

Syntax:

```
SDLC # Config> EXIT
```

Example:

```
SDLC # Config> EXIT
Config>
```

Chapter 3
Monitoring

1. Monitoring Commands

To enter the SDLC monitoring process, follow these steps:

1. At the (*) prompt, enter **PROCESS 3** or just **P 3**. This brings you to the monitoring prompt +.

```
*P 3
+
```

2. At the (+) prompt, enter the **NETWORK** command, and the number that identifies the interface associated with a previously configured SDLC device generally denominated #.

```
+ NETWORK #
SDLC Console
SDLC- #>
```

If for example the interface was 3, the screen would look like this:

```
+ NETWORK 3
SDLC Console
SDLC-3>
```

Command	Function
? (HELP)	List the monitoring commands or lists any parameter associated with that command
DELETE	Clears the link or remote station counters.
DISABLE	Prevents connections to an SDLC link station.
ENABLE	Allows connections to an SDLC link station.
LIST	Displays configured information for an SDLC link station.
SET	Configures a specific interface and remote-secondary station information.
TEST	Performs an echo test on a remote-secondary station.
EXIT	Exits the SDLC monitoring environment.

1.1. ? (HELP)

Use the **?** (HELP) command to list the available commands that are available from the current prompt level. You can also enter a **?** after a specific command name to list its options.

Syntax:

```
SDLC- #> ?
```

Example:

```
SDLC- #> ?
DELETE
DISABLE
ENABLE
LIST
SET
TEST
EXIT
SDLC- #>
```

1.2. DELETE

Use the **DELETE** command to clear counters for the remote-secondary end station. Use the SDLC list remote all command to list existing sessions.

Syntax:

```
SDLC- #> DELETE ?
LINK
REMOTE-SECONDARY
```

a) DELETE LINK

Deletes the counters on an SDLC interface.

Example:

```
SDLC- #> DELETE LINK
SDLC- #>
```

b) DELETE REMOTE-SECONDARY

Deletes the counters from a remote-secondary station or from all of them.

Example:

```
SDLC- #> DELETE REMOTE-SECONDARY C1
SDLC- #>
```

1.3. DISABLE

Use the **DISABLE** command to prevent connections being created with a SDLC link station.

Syntax:

```
SDLC- #> DISABLE ?
LINK
REMOTE-SECONDARY
```

a) *DISABLE LINK*

Prevents the establishment of SDLC sessions on any SDLC link stations on the interface.

When used in the monitoring environment, the disable command also terminates all existing connection on the link.

Example:

```
SDLC- #> DISABLE LINK
SDLC- #>
```

b) *DISABLE REMOTE-SECONDARY*

Prevents the establishment of an SDLC session to the specified remote-secondary end station (remote station name or address).

When used in the monitoring environment, the disable remote-secondary command also terminates any existing SDLC session.

Example:

```
SDLC- #> DISABLE REMOTE-SECONDARY C1
SDLC- #>
```

1.4. ENABLE

Use the **ENABLE** command to enable connections to SDLC link stations.

Syntax:

```
SDLC- #> ENABLE ?
LINK
REMOTE-SECONDARY
```

a) *ENABLE LINK*

Allows subsystems in the router (e.g. DLSw) to use SDLC´s facilities.

Example:

```
SDLC- #> ENABLE LINK
SDLC- #>
```

b) *ENABLE REMOTE-SECONDARY*

Allows connections to the specified remote-secondary end station (link station name).

Example:

```
SDLC- #> ENABLE REMOTE-SECONDARY C1
SDLC- #>
```

1.5. LIST

Use the **LIST** command in the SDLC monitoring process to display statistics specific to the data link layer and the interface.

Syntax:

```
SDLC- #> LIST ?
LINK
REMOTE-SECONDARY
```

a) *LIST LINK*

Syntax:

```
SDLC- #> LIST LINK ?
CONFIGURATION
COUNTERS
```

- *LIST LINK CONFIGURATION*

Displays information for the SDLC interface. Displayed output is identical to that generated with the list link command in the configuration environment.

Example:

```
SDLC- #> LIST LINK CONFIGURATION
Link configuration for:      LINK_1  (Enabled)

Default role:   PRIMARY    Type:        POINT-TO-POINT
Duplex:         FULL       Modulo:      8
Idle state:     FLAG       Encoding:    NRZ
Clocking:       INTERNAL   Frame size:  2048
Speed:          64000      Cable:       DCE

Timers:    XID/TEST response:    0.5 sec
           SNRM response:         2.0 sec
           Poll response:        0.5 sec
           Inter-poll delay:     0.2 sec
           RTS hold delay:       DISABLED
           Inter-frame delay:    DISABLED

Counters:     XID/TEST retry    4
              SNRM retry        6
              Poll retry        10
SDLC- #>
```

- *LIST LINK COUNTERS*

Displays information for the SDLC counters since the last **Teldat Router** restart or the last clear counters.

Example:

```
SDLC- #> LIST LINK COUNTERS
Link counters for: LINK_1     (ENABLED)
I-Frames    I-Bytes   Re-Xmit   UI-Frames  UI-Bytes
--------    -------   -------   ---------  --------
Send   0    0         0         0          0
Recv   0    0         0         0          0
RR          RNR  REJ
--------    ---  ---
Send   0    0    0
Recv   0    0    0
SDLC- #>
```

The meaning of each field is:

I-Frames Total number of information frames received and sent.

I-Bytes Total number of information bytes received and sent.

Re-Xmit Total number of re transmitted frames.

UI-Frames Total number of Unnumbered Information frames received and transmitted.

UI-Bytes Total number of Unnumbered Information bytes received and transmitted.

RR Total number of RRs (Receive Ready) frames received and transmitted.

RNR Total number of RNRs (Receive Not Ready) frames received and transmitted.

REJ Total number of Rejects received and transmitted.

b) LIST REMOTE-SECONDARY

Syntax:

```
SDLC- #> LIST REMOTE-SECONDARY ?
ALL | <name> | <address> STATUS or <name> | <address>
ALL | <name> | <address> COUNTERS
```

- *LIST REMOTE-SECONDARY ALL / <name> / <address> STATUS*

Syntax:

```
SDLC- #> LIST REMOTE-SECONDARY ALL | <name> | <address> [STATUS]
```

Displays status for the specified SDLC link station (link station name) on the interface.

Example:

```
SDLC- #> LIST REMOTE-SECONDARY ALL
Address  Name      Status     Max BTU  Rx Win  Tx Win  Role
-------  ----      ------     -------  ------  -------  ----------
A0       SDLC_A0   IDLE       2048     7       7       NEGOTIABLE
C1       SDLC_C1   IDLE       2048     7       7       SECONDARY
C2       SDLC_C2   DISABLED   2005     7       7       NEGOTIABLE
C3       SDLC_C3   DISABLED   2009     7       7       NEGOTIABLE
SDLC- #>
```

Or:

Example:

```
SDLC- #> LIST REMOTE-SECONDARY C2
Address   Name       Status     Max BTU   Rx Win   Tx Win  Role
-------   -------    --------   -------   ------   ------  ----------
C2        SDLC_C2    DISABLED   2005      7        7       NEGOTIABLE
SDLC- #>
```

The meaning of each field is:

Address The address of the SDLC link station.

Name The character string name defining the SDLC link station.

Status The status of the SDLC link station, possible values are:

Enabled	Enabled, but not allocated.
Idle	Allocated but not used yet.
Connected	Connected.
Discnected	Disconnected.
Connecting	Connection establishment in progress.
Discnectng	Disconnection in progress.
Recovering	Attempting to recover from a temporary data link error
Disabled	Disabled.

Max BTU The frame size limit of the remote station. This frame size must not be larger than the maximum basic transmission unit (BTU) packet size configured with the set link frame size command.
The default is 521 bytes.

Rx Window The size of the receive window.

Tx Window The size of the transmission window.

- *LIST REMOTE-SECONDARY <name> / <address> COUNTERS*

Displays frame transmit and receive counts for the specified remote-secondary station.

Example:

```
SDLC- #> LIST REMOTE-SECONDARY C1 COUNTERS
Counters for: SDLC_C1, address C1 (ENABLED)
I-Frames      I-Bytes     Re-Xmit  UI-Frames  UI-Bytes  XID-Frames
-------------------------------------------------------------------
Send   569    88870       0        0          0         0
Recv   345    4804        0        0          0         0

RR            RNR  REJ  TEST  SNRM  DISC
---------------------------------------
Send   4779   0    0    1     1     0
Recv   4443   0    0    1     0     0

UA         DM   FRMR
--------------------
Send   0   0    0
Recv   1   0    0

SDLC- #>
```

The meaning of each field is:

I-Frames Total number of information frames received and sent.

I-Bytes Total number of information bytes received and sent.

Re-Xmit Total number of re transmitted frames.

UI-Frames Total number of Unnumbered Information frames received and transmitted.

UI-Bytes Total number of Unnumbered Information bytes received and transmitted.

XID-Frames Total number of Exchange Identification frame received and transmitted.

RR Total number of Receive Ready frames received and transmitted.

RNR Total number of Receive Not Ready frames received and transmitted.

REJ Total number of Rejects received and transmitted.

TEST Total number of Rejects received and transmitted.

SNRM Total number of Set Normal Response Mode frames received and transmitted.

DISC Total number of Disconnect frames received and transmitted.

UA Total number of Unnumbered Acknowledgment frames received and transmitted.

DM Total number of Disconnected Mode frames received and transmitted.

FRMR Total number of Frames Reject frames received and transmitted.

1.6. SET

When used in the SDLC monitoring environment, the **SET** command enables you to dynamically configure specific information for one or all SDLC link stations without affecting the router´s non-volatile configuration memory.

You can only issue the **SET** command on disabled stations. You can only issue the **SET LINK** command on a disabled link. All time values are in seconds, with a 0.1 second resolution.

Syntax:

```
SDLC- #> SET ?
LINK
REMOTE-SECONDARY
```

a) SET LINK

Syntax:

```
SDLC- #> SET LINK ?
MODULO
NAME
POLL
ROLE
RTS-HOLD
SNRM
TYPE
XID/TEST
```

- *SET LINK MODULO*

Syntax:

```
SDLC- #> SET LINK MODULO
Valid values are: 8 128
```

Dynamically changes the range of sequence numbers to be used on the data link without affecting the SRAM configuration. MODULO 8 specifies a sequence number range of 0-7, and MODULO 128 specifies 0-127. Default is 8.

Example:

```
SDLC- #> SET LINK MODULO 8
SDLC- #>
```

Note: When you change this value, the transmit and receive window sizes become invalid.

Use the set remote command to change the receive-window and transmit-window sizes. Valid window sizes for modulo 8 are 0 to 7; valid window sizes for modulo 128 are 8 to 127.

- *SET LINK NAME*

Syntax:

```
SDLC- #> SET LINK NAME
```

Dynamically changes the name of the link without affecting the SRAM configuration. A maximum of 8 characters may be entered. This parameter is for informational purposes only.

Example:

```
SDLC- #> SET LINK NAME
Enter link name: [LINK_1]?
SDLC- #>
```

- *SET LINK POLL*

Syntax:

```
SDLC- #> SET LINK POLL ?
DELAY
RETRY
TIMEOUT
```

SET LINK POLL DELAY

Dynamically changes the time delay between polls sent over the interface.

Example:

```
SDLC- #> SET LINK POLL DELAY
Enter delay between polls [0.2]?
SDLC- #>
```

SET LINK POLL RETRY

Dynamically configures the number of times the interface retries to poll the remote SDLC link station before deciding the link station is down and closing the connection.

Example:

```
SDLC- #> SET LINK POLL RETRY
Enter poll retry count (0 = forever)[10]?
SDLC- #>
```

SET LINK POLL TIMEOUT

Dynamically changes the amount of time the router waits for a poll response before timing out.

Example:

```
SDLC- #> SET LINK POLL TIMEOUT
Enter poll timeout [0.5]?
SDLC- #>
```

• *SET LINK ROLE*

Dynamically configures the interface as an SDLC primary link station (default) or the role of the interface without affecting the router's non-volatile configuration memory.

> ***Note: The SDLC interface negotiates only to primary. It does not negotiate to secondary.***

Syntax:

```
SDLC- #> SET LINK ROLE ?
NEGOTIABLE
PRIMARY
```

SET LINK ROLE NEGOTIABLE

Example:

```
SDLC- #> SET LINK ROLE NEGOTIABLE
SDLC- #>
```

SET LINK ROLE PRIMARY

Example:

```
SDLC- #> SET LINK ROLE PRIMARY
SDLC- #>
```

- *SET LINK RTS-HOLD*

Dynamically changes the time to hold RTS high after transmitting a frame without affecting the router's non-volatile configuration memory. This setting is for half-duplex mode. It has no effect on full-duplex mode.

Example:

```
SDLC- #> SET LINK RTS-HOLD
Enter RTS hold duration after transmit complete [0.0]?
SDLC- #>
```

- *SET LINK SNRM*

Syntax:

```
SDLC- #> SET LINK SNRM ?
RETRY
TIMEOUT
```

SET LINK SNRM RETRY

Dynamically changes the number of times to retransmit an SNRM (E) without receiving a response before giving up.

Example:

```
SDLC- #> SET LINK SNRM RETRY
Enter SNRM retry count (0 = forever) [6]?
SDLC- #>
```

SET LINK SNRM TIMEOUT

Dynamically changes the time to wait for a Unnumbered Acknowledgments (UA) response before re transmitting an SNRM.

Example:

```
SDLC- #> SET LINK SNRM TIMEOUT
Enter SNRM response timeout [2.0]?
SDLC- #>
```

- *SET LINK TYPE*

Syntax:

```
SDLC- #> SET LINK TYPE ?
MULTIPOINT
POINT-TO-POINT
```

Dynamically changes the SDLC link to either a multipoint link or a point-to-point link without affecting the router's non-volatile configuration memory.

SET LINK TYPE MULTIPOINT

Example:

```
SDLC- #> SET LINK TYPE MULTIPOINT
SDLC- #>
```

SET LINK TYPE POINT-TO-POINT

Example:

```
SDLC- #> SET LINK TYPE POINT-TO-POINT
SDLC- #>
```

- *SET LINK XID/TEST*

Syntax:

```
SDLC- #> SET LINK XID/TEST ?
RETRY
TIMEOUT
```

SET LINK XID/TEST RETRY

Dynamically changes the maximum number of times an XID or TEST frame is resent before giving up.

Example:

```
SDLC- #> SET LINK XID/TEST RETRY
Enter XID and TEST retry count (0 = forever) [4]?
SDLC- #>
```

SET LINK XID/TEST TIMEOUT

Dynamically changes the maximum amount of time to wait for an XID or TEST frame response.

Example:

```
SDLC- #> SET LINK XID/TEST TIMEOUT
Enter XID and TEST frame response timeout [2.0]?
SDLC- #>
```

b) SET REMOTE-SECONDARY

Syntax:

```
SDLC- #> SET REMOTE-SECONDARY ?
ADDRESS
MAX-PACKET
NAME
RECEIVE-WINDOW
ROLE
TRANSMIT-WINDOW
```

- *SET REMOTE-SECONDARY ADDRESS*

Changes the remote station's SDLC address within a range of 01 to FE.

Example:

```
SDLC- #> SET REMOTE-SECONDARY C1 ADDRESS
Enter station address (in hex) [C1]? CE
SDLC- #>
```

- *SET REMOTE-SECONDARY MAX-PACKET*

The maximum size of the packet that a remote secondary station can receive. The default size is 521 bytes.

Note that you cannot set the maximum packet size larger than the link frame size configured with the set link frame size command. If you do this, the router automatically resets the max packet size to the link frame size.

Example:

```
SDLC- #> SET REMOTE-SECONDARY C1 MAX-PACKET
Enter max packet size [2048]? 521
SDLC- #>
```

- *SET REMOTE-SECONDARY NAME*

This command assigns a name to the SDLC station. A maximum of 8 characters may be entered.

Example:

```
SDLC- #> SET REMOTE-SECONDARY C1 NAME
Enter remote station name [SDLC_C1]? Brad
SDLC- #>
```

- *SET REMOTE-SECONDARY RECEIVE-WINDOW*

The maximum number of frames that can be received by the router before sending a response.

Example:

```
SDLC- #> SET REMOTE-SECONDARY C1 RECEIVE-WINDOW
Enter receive window [7]? 4
SDLC- #>
```

- *SET REMOTE SECONDARY ROLE*

Changes the role of the remote-secondary SDLC station, possible values are: SECONDARY or NEGOTIABLE.

Syntax:

```
SDLC- #> SET REMOTE-SECONDARY <name> / <address> ROLE ?
NEGOTIABLE
SECONDARY
SDLC- #>
```

SET REMOTE-SECONDARY <name> / <address> ROLE NEGOTIABLE

Example:

```
SDLC- #> SET REMOTE-SECONDARY C1 ROLE NEGOTIABLE
SDLC- #>
```

SET REMOTE-SECONDARY <name> / <address> ROLE SECONDARY

Example:

```
SDLC- #> SET REMOTE-SECONDARY C1 ROLE SECONDARY
SDLC- #>
```

- *SET REMOTE-SECONDARY TRANSMIT-WINDOW*

The maximum number of frames that the router can transmit before receiving a response frame.

Example:

```
SDLC- #> SET REMOTE-SECONDARY C1 TRANSMIT-WINDOW 6
Enter transmit window [7]?
SDLC- #>
```

1.7. TEST

Transmits a specified number of TEST frames to the specified remote-secondary link station and waits for a response. Use this command to test the integrity of the connection.

> ***Note: Disable the specified link station before using this command.***

Syntax:

```
SDLC- #> TEST REMOTE <name> | <address> <# frames> <frame-length>
```

Example:

```
SDLC- #> TEST REMOTE C1
Number of frames to send [1]? 5
Frame length [265]?
Starting echo test -- press any key to abort
5 frames sent, 5 frames received, 0 compare errors, 0 timeouts
SDLC- #>
```

The meaning of each field is:

Number of frames Total number of frames to send.

Frame length Length of the frame sent. This frame cannot be any larger than the maximum frame length of the remote-secondary station.

Cancel the test by pressing any key.

1.8. EXIT

Use the **EXIT** command to return to the previous prompt level.

Syntax:

```
SDLC- #> EXIT
```

Example:

```
SDLC- #> EXIT
+
```

2. Statistics display in SDLC Interfaces

You can use the **DEVICE** command to display statistics for SDLC devices without entering the SDLC monitoring module. To do this, enter the **DEVICE** command and an interface number at the (+) prompt, as shown:

Example:

```
+ DEVICE 3
                                  Auto-test  Auto-test  Maintenance
Ifc   Interface  CSR       Vect   valids     failures   failures
3     SDLC/1     80000000  9E     1          0          0

Driver type:   DCE

V.24 circuit:   105   106   107   108   109
Nickname:       RTS   CTS   DSR   DTR   DCD
State:          OFF   OFF   OFF   OFF   OFF

Line speed:        19.200 Kbps
Last port reset:   1 minute, 24 seconds ago

Input frame errors:
CRC error      = 0   Alignment (byte length) = 0
missed frame   = 0   too long (>02053 bytes) = 0
aborted frame  = 0   DMA/FIFO overrun         = 0

Output frame counters:
DMA/FIFO underrun errs = 0   Output abort frames   = 0
+
```

The meaning of each field is:

Ifc	Interface number assigned by software during initial configuration.
Interface	Type of interface.
CSR	Memory location of the control status register for the SDLC interface.
Vect	Interruption vector.
Auto-test valids	Number of times the SDLC interface passed its self-test.
Auto-test failures	Number of times the SDLC interface was unable to pass its self-test.
Maintenance failures	Number of maintenance failures.
Driver type	The interface is an RS-232 DCE.
V.24 circuit	Circuits in use on the V.25 circuit.

Nicknames	Names for the V.24 circuits.
State	State of V.24 circuits, signals, and pin assignments (ON or OFF).
Line speed	Normal speed for the line configured for the SDLC interface.
Last port reset	How long ago the port was last reset.
Input frame errors	Input frame error type (CRC error, too short, aborted, alignment, too long, DMA/FIFO overrun) and the total number of errors that have occurred.
Output frame counters	Total number of DMA/FIFO overruns and output aborts transmitted.