

DL-64

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1. DESCRIPTION

The DL-64 DSU/CSU is designed for 56 or 64 Kbps synchronous operation over 4-wire point-to-point or multi-point digital leased lines. The DL-64 can also be used as a line driver over customer owned wire for links up to 5 miles. The DL-64 is very simple to set up. For the typical application, the DL-64 can be attached to the phone line, plugged in and be in operation in minutes.

Special features of the DL-64 series DSU/CSU include the following:

- Easy setup
- 56 or 64 Kbps operation
- Telephone company digital line use or local line driver

NOTE

Line driver and multi-point functions are only available in 56 Kbps mode.

2. SPECIFICATIONS

2.1 Data Signaling Rates and Modulation

Digital line rate of 56 or 64 Kbps
Bi-polar non-return-to-zero modulation
135 ohm \pm 10% transmit impedance
Transmit level @ 135 ohm load, 56 kbps, 1.4v peak
135 ohm \pm 10% receive impedance
Receive level sensitivity, -49 dB
Automatic equalization

2.2 Operating Mode

Full duplex
Constant carrier
Point-to-point

2.3 DTE Timing

Synchronous rate of 56 or 64 Kbps

2.4 Transmission Line

4 wire leased line, telephone company digital line (DDS)
4 wire in-house, 2 twisted pair, for line driver

2.5 Loopbacks

Local Bidirectional (toward terminal and toward phone line)
Telco initiated CSU or DSU loopback.

2.6 Connectors

Telco: RJ-48S
RS-232D: DB-25 female
V.35: M34 female

2.7 Physical/Electrical

10¼" W x 9¾" D x 2½" H

1 pound

120 VAC, 18 Watts

External 9 VDC, 500 ma power supply

2.8 Environmental

Operation: 0 to 75° C, non-condensing humidity

Storage: -40 to 85° C, non-condensing humidity

3. INSTALLATION

3.1 Unpacking

The following is included with all DL-64 DSU/CSU's:

- DL-64 DSU/CSU and external power supply
- RJ-45 cable to connect to the phone line
- manual
- information regarding warranty, maintenance contract and repair

3.2 Location

Place the DSU/CSU in an uncluttered area where you can reach the rear panel to connect the cables. The DL-64 has an external power supply that is plugged into a 120 VAC outlet. The power cord length is about 6 feet.

3.3 Setup

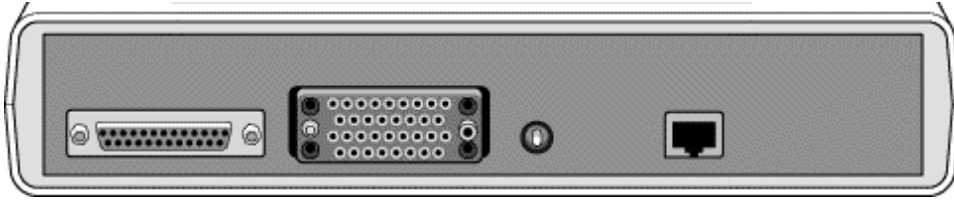
The DL-64 will typically work in point-to-point or multi-point applications right out of the box. The default configuration covers 90% of typical applications. The defaults are as follows:

56 Kbps
Slave Clock (phone company timing)
Internal Transmit Clock
RTS Normal

For in-house line driver applications, set the host DL-64 for 56 Kbps (switch position 1 DOWN) and Master Clock (switch position 2 UP).

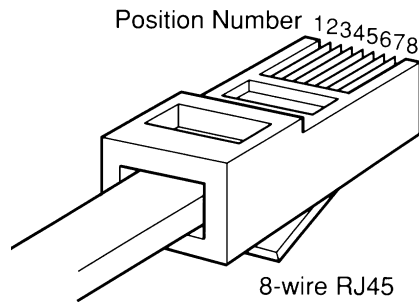
The switches are located behind an access door on the right side of the unit. See paragraph 4.1.3 for more information.

3.4 Telephone Line Connections



DL-64 Rear Panel Connectors

The phone line cable supplied with the DL-64 has an RJ-45 plug at both ends. Positions 1 and 2 are the transmit pair, positions 7 and 8 are the receive pair.

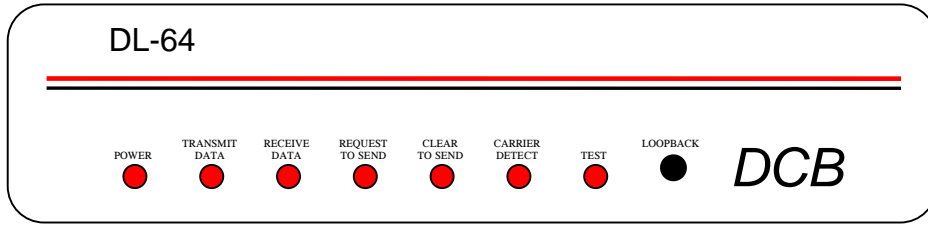


RJ-45 Plug Positions

3.5 Installation Steps

1. Connect the RJ-48S cable between the phone line demarc and the DSU/CSU.
2. Connect the DTE device cable. Refer to Section 6 for information about the DTE interface.
3. Connect the round power supply connector to the DSU/CSU and plug the power supply into a convenient AC outlet.

4. CONTROLS AND INDICATORS



DL-64 Front Panel

4.1 Controls

4.1.1 Loopback Switch

The Loopback switch initiates a bi-directional loopback. When loopback is active, the TEST indicator is on.

4.1.2 Reset Switch

The Reset (pushbutton) switch is located behind the access panel on the right side of the unit next to the DIP switches.

4.1.3 DIP Switches

The DIP switches are located behind an access panel on the right side of the unit. To remove the panel, slide the latch toward the front of the unit and pull out on the latch end of the panel.

The switch functions are shown in the following table:

Switch	Down	Up
1	56K	64K
2	Slave Clock	Master Clock
3	Internal TX Clock	External TX Clock
4	RTS Normal	RTS Forced ON
5	Normal	Local Loop ON
6	Not Used	

NOTE

RTS mode (sw 4) is active in 56Kbps mode only. In 64Kbps mode, RTS is forced on.

If external TX clock (sw 3) is selected in 64K mode, a “gapped” clock must be supplied.

4.2 Indicators

POWER

On when the DSU/CSU has power.

TRANSMIT DATA

Flashes when data is being sent.

RECEIVE DATA

Flashes when data is being received.

REQUEST TO SEND

Follows RTS from interface unless forced on.

CLEAR TO SEND

Follows RTS.

CARRIER DETECT

Normally ON.

TEST

ON steady when the loopback switch is depressed.

FLASHING when the unit receives a phone company initiated loopback.

5. INTERFACE SIGNALS

5.1 TELCO Jack (RJ-48S)

<u>Pin</u>	<u>Signal</u>
1	Transmit Data
2	Transmit Data
7	Receive Data
8	Receive Data

5.2 RS-232D / V.24 Interface (DB-25S)

<u>Pin</u>	<u>Signal Name</u>	<u>In/Out</u>
1	Frame Ground	---
2	Transmit Data	IN
3	Receive Data	OUT
4	Request to Send	IN
5	Clear to Send	OUT
6	Data Set Ready	OUT
7	Signal Ground	---
8	Data Carrier Detect	OUT
15	Transmit bit clock	OUT
17	Receive bit clock	OUT
24	External Transmit Clock	IN

5.3 V.35 Interface (M34 female)

<u>Pin</u>	<u>Signal Name</u>	<u>Signal Source</u>
A	Frame Ground	
B	Signal Ground	
C	Request to Send	Terminal (unbalanced)
D	Clear to Send	DSU (unbalanced)
E	Data Set Ready	DSU (unbalanced)
F	Data Carrier Detect	DSU (unbalanced)
P	Transmit Data A	Terminal (balanced)
S	Transmit Data B	Terminal (balanced)
R	Receive Data A	DSU (balanced)
T	Receive Data B	DSU (balanced)
Y	Transmit Clock A	DSU (balanced)
AA	Transmit Clock B	DSU (balanced)
U	Terminal Timing A	DSU (balanced)
W	Terminal Timing B	DSU (balanced)
V	Receive Clock A	DSU (balanced)
X	Receive Clock B	DSU (balanced)

6. TROUBLESHOOTING

6.1 General Approach

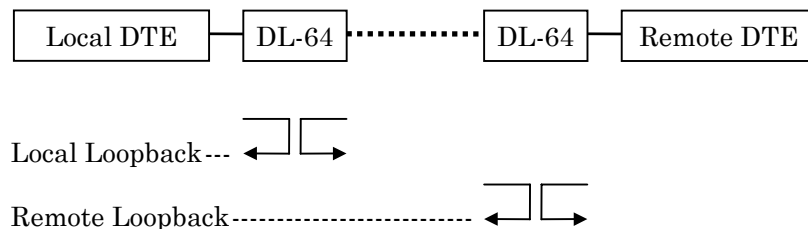
When troubleshooting problems, a rational plan can save you many hours of frustration. The following is a brief outline of standard troubleshooting procedures.

1. Gather the facts to determine the exact nature of the problem.
2. Draw a picture of the system showing the host computer, the DSU/CSU, the phone line, the remote DSU/CSU and the terminal/controller/computer at the far end. Use this as reference to note your observations, test steps and test results. A picture keeps you focused and often saves duplicate test steps.
3. Record the front panel indicators before changing anything. This is an important part of fact gathering.
4. If you change anything, change only one thing at a time.
5. Use loopbacks and record your results.

6.2 Loopback Tests

Use progressive loopbacks, starting at one end and working toward the other end of the link. As each loopback is enabled, press keys on the local DTE (terminal) and note if the characters are displayed on the screen. If your keypresses are displayed, the test passed. Use your system diagram to keep track of the loopbacks and the results.

Perform loopback tests working from the local end to the far end of the line.



7. WARRANTY

DCB DSUs are warranted to be free of defects in materials and workmanship for five years. Data Comm for Business, Inc. will repair or replace any equipment proven to be defective within the warranty period. All warranty work is F.O.B. Dewey, IL. This warranty is exclusive of abuse, misuse, accidental damage, acts of God or consequential damages, etc. DCB liability shall not exceed the original purchase price.

All equipment returned for repair must be accompanied by a Returned Material Authorization (RMA) number. To receive an RMA number, call (217) 897-6600 between the hours of 8 AM and 5 PM central time. Equipment must be shipped prepaid to DCB and will be returned at DCB's expense.

Ship returned items to:

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