TC4221 Digital Display Installation

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General Information

Description

This unit comes assembled on a metal baseplate. It converts a standard push-button phone to a display phone that can be used with Telecenter® V, Telecenter IV, Telecenter TCS, Telecenter System 21, or TC1100 systems. It has a 16-digit LCD readout and a "beeper" to annunciate call-ins. The TC4221 can be used as a direct replacement for a TC4220, but it offers a number of new features as well, notably its capability of being individually addressed in a Telecenter V and Telecenter System 21 system.

The display matches the Rauland TC4204 Administrative Telephone. It can be used with many other DTMF (dual-frequency, multi-tone) desk phones, the only limitation being aesthetics. Figure 1 shows a typical placement.

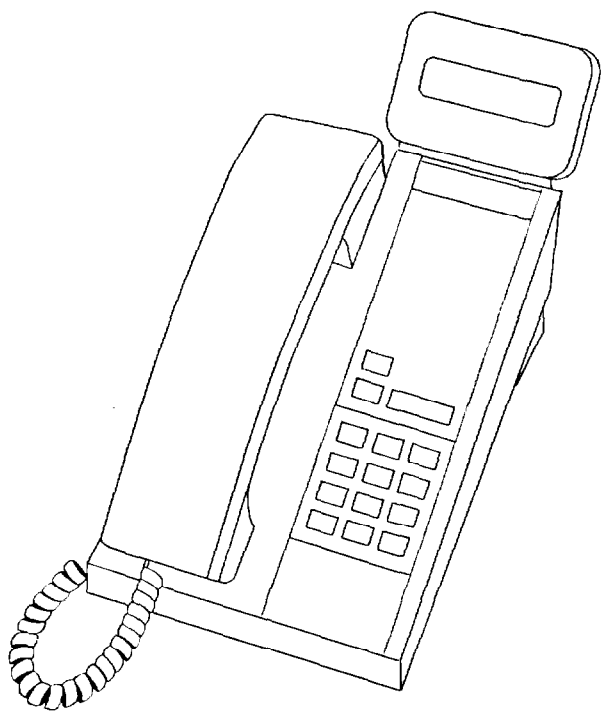


Figure 1. Typical Placement of Display

Parts Enclosed

The following parts should come with the display:

- √ 1" × 2½" double-sided foam strip, for fastening the display to the telephone.
- √ Nine-inch, six-conductor modular phone cord.

Number of Displays

Telecenter V and Telecenter System 21 systems have a single display driver that can support up to 2,000 feet of cabling and 16 displays. Each display may be assigned its own address with its DIP switch (see "Setting the DIP Switch," the final section of this manual).

Telecenter 1100, Telecenter IV, and Telecenter TCS systems can support up to 1,000 feet of cabling and three displays per display driver. Telecenter 1100 systems have one display driver, Telecenter IV systems have two display drivers, and Telecenter TCS systems have six display drivers.

Related Manuals

See the appropriate system manuals for details on wiring and programming:

Telecenter V

The main wiring diagram (KM1035) includes the wiring for display phones. It is part of the Telecenter V drawings manual, included in KI-1687.

Telecenter IV

The wiring diagram for display telephones (KM0684) is in the *Drawings and Glossary* manual (KI-1587), which is part of the main manuals (KI-1435). For programming information, see KI-1584, also part of the main manuals.

Telecenter TCS

The wiring diagram for display telephones (KM0837) is in *Diagnostics, Troubleshooting, and Drawings* (KI-1550), which

Orig. 2/92. Rev. 8/92, 9/93.

is part of the main manuals (KI-1579). For programming information, see KI-1538, also part of the main manuals.

Telecenter 1100

The display module is recommended for Telecenter 1100 systems, which include the CTL1 Telephone Interface. See drawings KM1032 and KM1033 in the CTL1 ChronoCom Telephone Interface Module installation manual (KI-1681). For programming information, see the 2524 programming manual (KI-1629).

Telecenter System 21

The wiring diagram for display phones (KM1121) is in the Installation Drawings manual, KI-1767.

Installation

Mechanical

Note: For Telecenter V and Telecenter System 21 systems, set each display's DIP switch before attaching the display to a telephone. See "Setting the DIP Switch," on the following page.

Before attaching the assembly to the telephone, install the nine-inch modular phone cord and anything else that might be covered by the assembly. Use the double-sided foam to secure the assembly to the phone. Do not cover anything with the foam that you might need to remove in the future (e.g., the cord that runs from the display unit to the phone.

Caution: The foam bonds tightly to any hard surface it touches. To assure a smooth installation, stick the foam to the display unit first. Before touching the foam to the telephone, make sure the display is properly aligned.

Wiring

This section tells the basic connections. For details, consult the system manuals listed above and the manufacturer's manual for any other component (e.g., a special-features telephone).

Observe Proper Polarity!

This is especially important for the display, which could suffer damage from several minutes of exposure to reverse polarity. To avoid damage, promptly disconnect the display if it does not show the sign-on message a few seconds after you turn on the system. Check all wiring connections and the polarity of the modular connectors on the desk cord and the cord between the display and the phone.

The positive LCD output should be connected to the "BK" ("Black") terminal, and the negative output to the "YL" ("Yellow") terminal of the telephone terminal block. See Figure 2 and the wiring table.

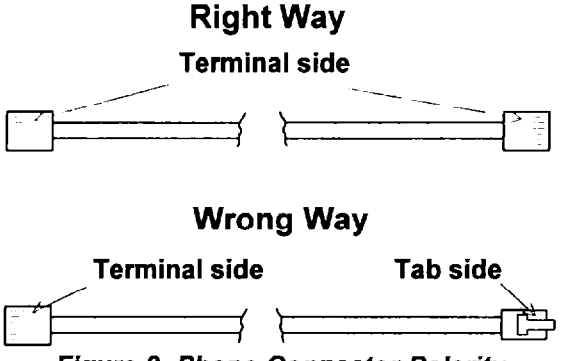


Figure 2. Phone-Connector Polarity

Modular Cords

From a Modular Jack to the Display: For a standard phone, use a standard four-conductor, six-position line cord. Make sure that the modular plugs' terminals are on the same side of the cord (see Figure 2).

From the Display Jack to the Telephone: Use the supplied nine-inch cord.

Connections

Use the following table or the wiring diagrams listed earlier for the wiring connections.

Display and Telephone Connections

Modular Block Terminal	Function	TCV/ TC2100 Terminals	TCIV/TCS LLM Terminals	TC1100 Terminals
Red Green	Telephone	R T	R T	(Phone jack on the CTL1
Black (+) Yellow (-)	Display	Display B Display Y (shield to Z)	LCD+ LCD– (shield to Z)	LCD+ LCD– (on 2524)
Blue White	Special Function	See the feature phone's manual.	See the feature phone's manual.	See the feature phone's manual.

Note: (1) The display does not use the blue and white wires, but simply passes them on from its line receptacle to its phone receptacle.
(2) Alternatively, you can wire Telecenter V display phones to a punch block. See the main wiring diagram (KM1035) in the TCV manuals. Telecenter System 21 displays can also be wired direct to the MSM port punch blocks. See the appropriate diagram in the Telecenter System 21 Installation Drawings manual, KI-1767.

Adjusting the Display

The contrast adjustment for the display can be accessed through the lower left hole in the back of the unit (as viewed from the rear). Use a small, flat-blade screwdriver for the adjustment.

Troubleshooting

Use a voltmeter to check the "Display" terminals (black and yellow wires): during normal operation, you should get a reading of 10 to 12 VDC. Within five seconds of being turned on, the display should show an initial message, such as "VerVVV DD," where "VVV" represents the software version number, and "DD" represents the DIP-switch setting. (Note that, the first time, you may need to adjust the contrast to see the message.)

Note: You can check the display apart from the system, by using a separate power source (12 VDC, 5-10 mA).

Setting the DIP Switch

Overview

The eight-position DIP switch on the back of the display configures the unit for different systems.

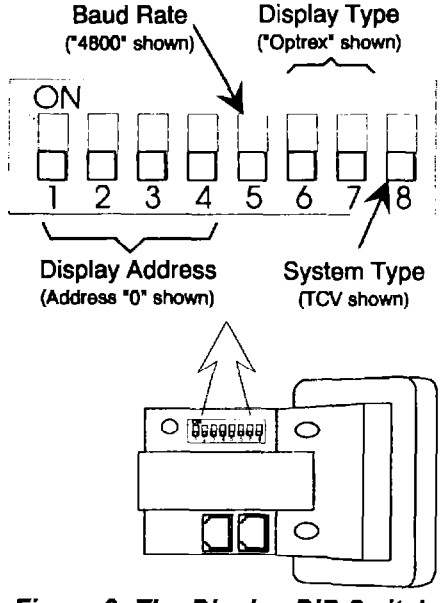


Figure 3. The Display DIP Switch

Important: The TC4221 checks the DIP-switch settings only when it is powered up. It will ignore changes made while it is running, until its power has been cycled off and back on (e.g., by momentarily unplugging its line cord).

TC4221 DIP-Switch Summary

Function	Switch	Comments
Display Address (0-15)	1 2 3 4	TCV and TC2100 only (see the table below). Set to "Off" for other systems.
Baud-Rate Selection	5	On = 9600 baud Off = 4800 baud (factory setting)
Display Type	6	Off = Optrex On = Hitachi
	7	(Always Off) *Note:* Leave 6 and 7 in factory settings.
System Type	8	Off = TCV, TC2100 On = TCIV, TC TCS, TC1100

Diagnostic Mode

To select the diagnostic mode, set slide switches 1-5 and 8 *On* (that is, all but 6 and 7, which must always remain in their factory setting). This mode works with TCV (tone) and TC2100, or TCIV and TC1100 (pulse) applications.

The display shows all the characters received from either the pulse or the tone inputs as hexadecimal characters. When the screen is full, the display will pause a few seconds before showing the next screen of hexadecimal characters. The unit can buffer up to 30 undisplayed characters.

Here is a typical hex message on a Telecenter V system:

`01,81,1B,01,[Text]`
(`81` = *address 1*; `1B,01` = *Set Cursor 1*)

The Telecenter V system uses a 40-kHz carrier to transmit asynchronous, ASCII, serial data.

Telecenter V & Telecenter System 21

For TCV or TC2100 operation, push slide switch 8 *Off* and 5 *On*.

Display Address

Set slide switches 1-4 to give each display a different address (the settings correspond to binary numbers, with the least-significant digit on the left):

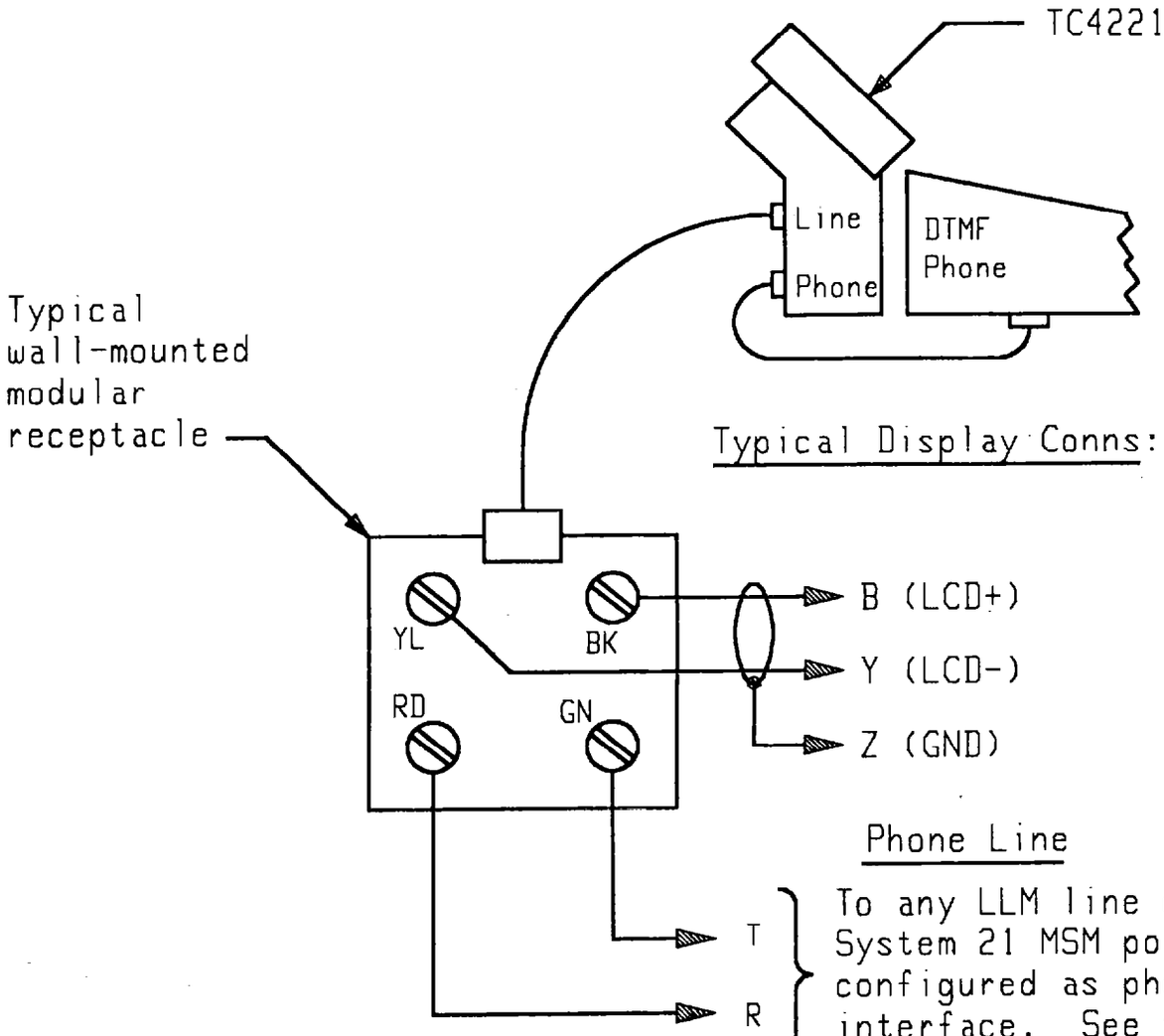
Slide-Switch Settings for Display Addresses

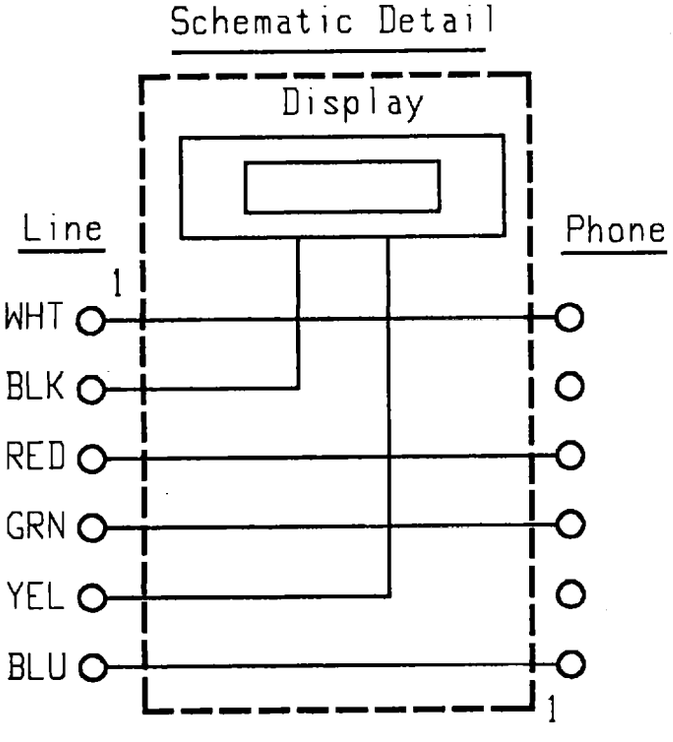
Display Address	1	2	3	4
0	Off	Off	Off	Off
1	On	Off	Off	Off
2	Off	On	Off	Off
3	On	On	Off	Off
4	Off	Off	On	Off
5	On	Off	On	Off
6	Off	On	On	Off
7	On	On	On	Off
8	Off	Off	Off	On
9	On	Off	Off	On
10	Off	On	Off	On
11	On	On	Off	On
12	Off	Off	On	On
13	On	Off	On	On
14	Off	On	On	On
15	On	On	On	On

Because the Telecenter V and Telecenter System 21 use a single display drive, all displays receive the same messages. However, only the unit with the corresponding address will display an individual message.

Other Systems

For Telecenter IV, Telecenter TCS, and Telecenter 1100 operation, set slide switch 8 *On* and switches 1 through 5 *Off*.





Also see the display-phone wiring diagram for the TCIV (KM0684), TCS (KM0837), or TC2100 (KM1125) in the appropriate main manual.

TC4221 Digital Display

KM1040 A