Tempo®

A Textron Company

Knowledge. Solutions. Success.

PE830 TELE-MATE® PRO TELEPHONE TEST SET

	⚠ WARNING
	Read and understand this material before operating or servicing this equipment. Failure to understand how to safely operate this tool can result in an accident causing serious injury or death.

The Tele-Mate® Pro Telephone Test Set will help deal with the increasing complexity of telecom installation and maintenance. A complete butt-in test set, the PE830 adds useful features like loudspeaker monitor, caller ID, speed dial, callback, intercom and line voltage/current/frequency meter.

The Model PE830 consists of:

Tele-Mate® Pro Telephone Test Set

HS-1 HEADSET

SAFETY ALERT SYMBOL

This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.

⚠ DANGER

Immediate hazards which, if not avoided, WILL result in severe injury or death.

⚠ WARNING

Hazards which, if not avoided, COULD result in severe injury or death.

⚠ CAUTION

Hazards which, if not avoided, MAY result in injury.

⚠ WARNING ⚠ ELECTRIC SHOCK HAZARD

• Do not expose this unit to rain or moisture.
• Contact with live circuits can result in severe injury or death.
• Use this unit for the manufacturer's intended purpose only, as described in this manual. Any other use can impair the protection provided by the unit.
• Use test leads or accessories that are appropriate for the application. See the category and voltage rating of the test lead or accessory.
• Inspect the test leads or accessory before use. The item(s) must be clean and dry, and the insulation must be in good condition.
• Before opening the case, remove the test leads from the circuit and shut off the unit.

Failure to observe these precautions may result in severe injury or death.

⚠ CAUTION

• Do not attempt to repair this unit. It contains no user-serviceable parts.
• Do not expose the unit to extreme temperatures or high humidity. See Specifications.
• Extra loud speaker warning like PE961

Failure to observe these precautions can result in injury and can damage the instrument.

CONTENTS

FIGURE INDEX

1. DESCRIPTION

The PE830 Tele-Mate® Pro Telephone Test Set will help deal with the increasing complexity of telecom installation and maintenance. A complete butt-in test set, the PE830 adds useful features like loudspeaker monitor, caller ID, speed dial, callback, intercom and line voltage/current/frequency meter.

The PE830 Tele-Mate® Pro not only works in handset mode, but can be used with the standard headset (included) and with the amplified loudspeaker line monitor. You can use the premium telco-type test leads and clips or the integral modular jack for line connection.

Features

- Complete telephone set with ringer
- Phone-to-phone intercom
- Modular or alligator clip connection
- Amplified loudspeaker line monitor
- Headset or handset operation
- Tone and pulse dialing
- Large 10-location speed dialing memory
- Five memory redial
- Caller ID with name display
- Call waiting Caller ID
- Missed call indication
- Line voltage and current display
- High voltage detect and lockout
- High current detect and lockout
- English, Spanish, German, or French language display

Key Specifications

- Bellcore and ETSI Caller ID compatible
- TIA/EIA RS-470-B or ETSI telephone performance selectable
- High voltage alert (120 VDC)
- High current alert (125 mA)

2. UNIT SET-UP

Battery Installation

The PE830 requires a 9V battery to be installed for all functions to operate. Tempo® recommends that only alkaline types are used, as these are more leak resistant and offer much longer operating life than standard zinc-carbon types.

When a battery is first installed, the unit will default to a Language Setup display as shown in Figure 5. Select a language before using the unit.

⚠ WARNING ⚠

Before opening the case, remove the test leads from the circuit and shut off the unit.

Failure to observe these warnings can result in severe injury or death.

To retain the memories and settings while replacing the battery, it is vital that the PE830's mode switch is set to "off" and the display is allowed to clear. Connect the new battery within thirty seconds of disconnecting the old one. Prepare by opening any battery packaging etc. before removing the old battery. Loosen the phillips head screw located below the earpiece and remove the battery cover. Insert a new alkaline battery, carefully checking that the polarity is correct and that the connector is fitted firmly before replacing the cover and re-tightening the screw (Do not overtighten the screw).

Low Battery Warning

When the battery voltage drops below 6 volts a warning sound will be produced each time the mode switch position changes. In addition a small battery icon ▮▷ is displayed in the lower left of the screen. If the battery voltage is allowed to drop below approximately 5 volts the unit will remind you to replace the battery for a few seconds and then return to standby mode.

Reset

The PE830 should start operating normally following battery insertion or replacement. If the unit fails to respond normally at any time, a manual reset can be performed by holding the "speaker" button down for more than ten seconds. When released the unit should start as normal, provided the battery voltage is greater than 5 volts.

3. BUTTONS & SWITCHES

The main mode switch is located on the right side of the unit. (See Figure 1) This switch has the following functions: MONITOR, OFF (ring) and TALK. These modes will be explained in more detail later in this guide.

The volume switch is located on the left side of the unit and has three selectable levels. The mute button is also situated on the left side of the unit. (See Figure 2)

Fig. 1 - Mode Switch
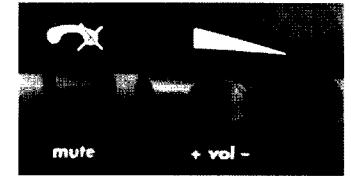
Fig. 2 - Volume & Mute Switch

Fig. 3 - Main Keypad

Operating Mode Icons

1. TALK (telephone mode)
2. OFF (ring only mode)
3. MONITOR (listen or ring mode)

The solid bar on the display indicates the operating mode.

The main keypad has seventeen keys. (See Figure 3) The top four buttons situated directly under the LCD have the following functions:

- Last number redial / Pause
- Tone or Pulse dialing selection
- Flash / Intercom (timed break recall)
- Memory recall/storing

The large button below the telephone keypad activates the Speaker.

4. OPERATING MODES

PE830 Tele-Mate® Pro Telephone Test Set has four operating modes: Setup, Talk, Monitor, and Off.

SetUp Mode

With the mode switch still set to MONITOR, simultaneously press MUTE and #, the unit then enters the setup mode. While in SETUP mode the language and other facilities can be configured. (See Figures 4 - 11)

Fig. 4 - Setup Main

Fig. 5 - Setup Language

```
DIAL SETTINGS:
0 Back
1 DTMF level
2 Flash time
3 Pulse ratio
```

Fig. 6- Dial Settings

```
PULSE RATIO:
 0 Back
>1 60:40ms
 2 66:33ms
```

Fig. 9- Pulse Ratio

```
DTMF LEVEL:
 0 Back
>1 -2dBm
 2 -5dBm
```

Fig. 7- DTMF Level

```
RING TONE:
 0 Back
>1 Tone 1
 2 Tone 2
 3 Tone 3
 4 Tone 4
```

Fig. 10 - Setup Ringtone

```
FLASH TIME:
 0 Back
>1 600ms
 2 270ms
 3 100ms
```

Fig. 8- Setup Flash

```
CONTRAST:
 0 Back
 1 Decrease
 2 Increase
```

Fig. 11 - Setup Contrast

Press the digit corresponding to the desired option to choose it.

To leave setup mode, press "0" (back) repeatedly or slide the mode switch to the OFF position. An invalid entry will result in the error tone being produced.

Talk Mode

With the main mode switch in the TALK position and connected to a suitable telephone line, the unit will go off-hook and dialing and speech will then be possible.

Flash

While off-hook, the Flash ⬤ key is enabled, this key generates a timed line break, which simulates a hook flash to activate special features of a PBX or central office. (See Figure 12)

```
-36mA
```

Fig. 12 - Flash

The flash duration is user selectable via the setup mode (see Setup Mode) as 100ms, 270ms, or the default of 600ms. The indication ᴎ᷉ is present on the bottom line of the display during Flash operation and for two seconds after.

Off-Line Dialing & Automatic Redial of Last CID Number

Digits entered by hand or received by calling line ID in OFF and MONITOR modes, will be dialed automatically upon switching to TALK. Any displayed number can be cleared by pressing and holding "mute" for one second. Short presses of "mute" act as a backspace allowing errors to be corrected before switching to TALK to dial.

Pause

The dual function ⬤ LNR/Pause key inserts an inter-digit delay of three seconds between digits dialed. The pause digit will be displayed as a '-' (minus sign) on the LCD and will be stored in memory. Note that if this were the first key pressed this would recall and immediately dial LNR (see Memory Functions).

Pulse Dialing Option

To make a call using pulse dialing, select PULSE mode by pressing the ⬤ key, then either dial or recall from memory the number to be called, the symbol ᴨ will be displayed on the bottom line of the display. Pressing the ⬤ key again would revert to tone mode. The dialing mode is also changeable from pulse to ⬤ tone while dialing by pushing the ⬤ , * or # keys. Such mid-call transitions of dialing mode are stored and shown as ♪ in the stored digit sequence indicating the requested change to tone mode. (See Figure 13)

```
-36mA
```

Fig. 13 - Pulse Dialing

Current Measurement

While the PE830 is off-hook the line current is displayed along with the polarity.

Over Current Protection
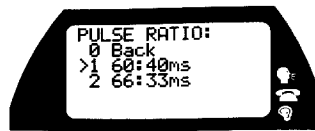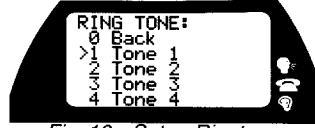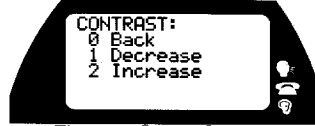
When the PE830 is off-hook it protects against line current over 125mA by automatically applying a current limit. If the condition is maintained for more than about half a second, the unit will go "on-hook", a warning message will be displayed and a warning sound is produced until the unit is disconnected from the line or switched to "off". (See Figure 14)

```
>125mA
Over-current!
Loop removed
```

Fig. 14 - Over Current

SmartMute™

A quick press of the MUTE button will toggle the microphone off or on and a confirming beep heard. A long press (over 1 second) will cause the microphone to be muted while the button is held. The MUTE symbol ⊠ is displayed while the microphone is deactivated.

Loudspeaker

Press ⬤ at any time in MONITOR or TALK modes to turn the speaker on or off. Note that the microphone is automatically muted if you are in TALK or INTERCOM modes. ◀)) is displayed whenever the speaker is active to remind you that two-way speech is not possible. The speaker remains on for the whole duration of a call, and is kept on while switching to another mode. Automatic power-down (see below) will turn the speaker off.

Monitor Mode

With the main mode switch in the MONITOR position the unit will be on-hook. This mode provides a high impedance connection that enables the user to listen to the line without loading it. (See Figure 15)

```
-47V
```
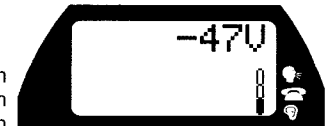
Fig. 15 - Monitor Mode

Monitor mode also constantly monitors and displays the line Voltage along with the polarity. With the red lead attached to ring and black to tip the display will show negative "-" voltage.

In the presence of incoming ring the display will provide line status information with caller ID if presented and a ringing alert signal will be produced from the loudspeaker (see Off Mode below).

Over Voltage Warning

The unit is protected against operating in TALK when voltages in exceed 120V. The warning tone will be generated and the screen will display the message "Over Voltage". (See Figure 16)

```
>120V
Over Voltage!
```

Fig. 16 - Over Voltage

Elevated Voltage Warning

If the unit is connected to a voltage between 80V and 120V, high-pitched beeps will be produced warning that this may not be a normal telephone line. You can still go off-hook by moving the mode switch to TALK.

Off Mode

With the main mode switch in the OFF position and connected to a line the unit will be on-hook and ready to receive incoming calls. (See Figure 17)

```
-47V
```
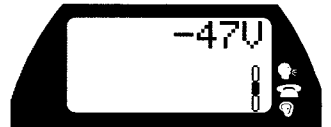
Fig. 17 - OFF Mode

The unit enters a power-saving state after a period of inactivity, but will wake up for incoming ring, caller ID or upon connection to another line; the display will then reactivate for a further period to provide line status information.

Answering Incoming Call

⚠ WARNING ⚠

Safety Notice: If ringing is continuous, the 830 assumes that this could be a "power cross", i.e. electrical power is connected to the telephone line and it could be dangerous to go off-hook.

While the PE830 is ringing, simply move the mode switch to the TALK position. (See Figure 18)

Note: The PE830 will not allow off-hook if ringing is continuous. Check the frequency reported on the screen; if this is approximately 60Hz (50Hz) then carefully disconnect from the line.

Fig. 18 - Power Cross

Automatic Power Down

The PE830 will power-down after periods of no user interaction in all modes, except active TALK mode. This reduces unnecessary battery drain.

- TALK mode with no DC detected: . . . . Five-minute timeout
- TALK mode with DC detected: . . . . No timeout
- INTERCOM mode: . . . . No timeout
- MONITOR mode: . . . . Fifteen-minute timeout
- OFF mode with no DC detected: . . . . Three-second timeout
- OFF mode with DC detected: . . . . Five-minute timeout

The PE830 can easily be re-activated following a timeout by switching to another mode, or connecting to DC (powered line).

5. MEMORY FUNCTIONS

Memory and store facilities are available when in all modes. There are ten memory locations for number storage and a multi-number "last number redial" store. These can be accessed as described below.

Last Number Redial

Fig. 19 - Automatic LNR

When in OFF or MONITOR modes the Redial ⊙⫶ key offers the user the ability to recall any of the last five numbers dialed or received by CLID on the unit. The numbers can be accessed by repeatedly pressing the ⊙⫶ key with number information displayed on the LCD. This number will be automatically dialed out when the switch is placed back to the TALK mode. (See Figure 19)

In TALK mode the ⊙⫶ key offers the last number dialed (or last CLID) only if no other digits have already been dialed; after dialing any digits this key becomes the PAUSE key.

Saving Speed Dial Number

Fig. 20 - Store Screen 1

Enter a number or leave an incoming ID message on the screen. Push the memory ⬤ key TWICE to enter the store mode, and then enter the button number (0-9). (See Figures 20 - 22)
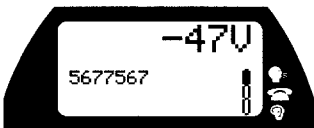

Fig. 21 - Store Screen 2
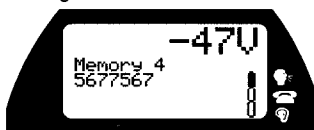

Fig. 22 - Store Screen 3

Recall Speed Dial Number

Fig. 23- Recall Screen 1

Push the ⬤ key once followed by the button number (0-9). (See Figures 23 - 25)

In addition to direct access by pressing the corresponding number, while on-hook, in OFF or MONITOR mode, repeatedly pressing the ⬤ key will allow you to scroll sequentially through all ten
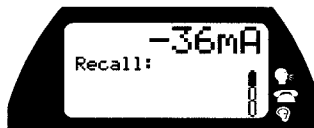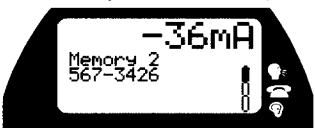

Fig. 24 - Recall Screen 2

Fig. 25 - Recall Screen 3

stored numbers. In all cases the number remains displayed, allowing automatic dialing by simply switching to TALK.

Note: If a location recalled is unused then no number will be displayed.

6. INTERCOM (LOCAL BATTERY) MODE

The intercom mode is a special feature to allow two PE830's to communicate without any telephone service available. In this mode only speech signals pass over the telephone pair, no DC power (talk battery) is available. The "Smartintercom" feature will only work with other PE830s. The intercom feature will only work if there is no voltage on the line. (See Figures 26 - 28)

Fig. 26 - Intercom 1

Fig.27 - Intercom 2

Fig. 28 - Intercom 3

To activate either "intercom" mode, start with the mode switch in MONITOR position and press the ⊘ "Flash" button. You will be presented with the menu shown below; by default SmartIntercom will be selected. However, if there is a voltage on the line an error tone will sound.

To begin the call, and ring the far end, slide the mode switch to TALK.

If you are making a SmartIntercom call, when the distant unit recognizes the call request you will hear a regular "ring-back" tone from the loudspeaker. If there is no reply from the distant unit, after a few seconds you will hear an error beep.

Incoming SmartIntercom call alerts will be received in either OFF or MONITOR modes; you do not need to be in "intercom" mode to receive the alerting signal. The intercom-alerting signal (ring tone) is a fast cadenced higher pitched ring than normal. If this is heard then simply switch to TALK mode to answer the call, automatically placing the PE830 into intercom mode. A confirmation beep is produced to indicate that the INTERCOM mode is now active.

To leave intercom mode, simply move the mode switch from TALK to either OFF or MONITOR. A call-completed tone is sent down the line as you do this to alert the other user.

7. CALLER ID

CID and CIDCW information will be displayed in all modes, when available. Error messages will be displayed when the CID is detected, but not received in full, is corrupted or is of an incompatible type. (See Figures 29 - 30)

Fig. 29 - Caller ID

Fig.30 - Call Waiting

8. HEADSET

To use the PE830 "hands free" simply plug the supplied headset or another similar type into the socket at the top of the unit. This will automatically mute the internal earpiece and microphone. Note that the MUTE and SPEAKER buttons will operate as normal, i.e. will disable transmission when active.

9. SPECIFICATIONS

Telephone Compatibility:	TIA/EIA-470-B and ETSI
Storage Temperature:	-10°C (14°F) to +70°C (158°F)
Operating temperature:	0°C (32°F) to +50°C (122°F)

Humidity: . . . . up to 90%
operating95% storage, both with no condensation.

CID and CIDCW: . . . All FSK types including Bellcore TR-NWT-000030 (GR30)
SR-TSV-002476, and ETSI

Battery Life: Over three months of typical use; less than 40uA in OFF mode giving a shelf life with a new battery of at least 12 months. Only alkaline types recommended. It's always best to remove the battery if storing PE830 for long periods.

Loop Limits (at 48V):

Resistance: . . . . >5 k
Minimum current: . . . . <10 mA

DC Resistance:

Off-hook: . . . . <300
On-hook: . . . . >5 M

Monitor impedance: . . . . >400 k

Dialing:

Pulse:
Rate: . . . . 10 pps
Break: . . . . 60% or 66%
Inter-digit pause: . . . . 800 ms (leakage during break: >5 M)
DTMF/Tone: . . . . -4dBm /-6dBm (TIA/ EIA)
. . . . -9dBm / 8 -11dBm (ETSI)

FSK Caller Name/Number and Call Waiting:

Bellcore GR-30-CORE, TR-NWT-000030
ETSI FSK Types
Displays: Calling DN, Caller name

Soft Key Function (on two context sensitive keys):

Flash/Timed Break Recall: . . . . 100, 270, 600 ms
Memory dialing:
10 memories, 5 last dialed & 5 last received

Indicators:

LCD (96x48 pixels) displays the following:
Caller ID (name & number) & Call Waiting
Dialed number
Over-voltage conditions
Phone status (monitor, off/on hook etc.)
Line voltage: . . . . 120 Vdc max
Loop current: . . . . 125 mAmax
Ring frequency: . . . . 15 – 70 Hz

Line protection:

Over-voltage: . . . . 360 Vdc continuous
>500 V peak
Current limited: . . . . 140 mA
Lightning: . . . . ITU K.17, 20, 21 (1500 V)

Intercom Range: . . . . 6 km

10. GLOSSARY

On Hook (Idle): The phone is not active

Off Hook (Talk): The phone is activated

Monitor: The phone line is available for listening only

Line Current: The amount of current fed from the telephone line when off hook, in milliamperes (mA)

Flash: A momentary line current break used by the butt set to signal the phone system for special functions.

One-Year Limited Warranty

Tempo® warrants to the original purchaser of these goods for use that these products will be free from defects in workmanship and material for one year, excepting normal wear and abuse.

For all Test Instrument repairs within the Americas; you must first request a Return Authorization Number by contacting our Customer Service department at 1 940 325-3000 x256. This number must be clearly marked on the shipping label. Ship units Freight Prepaid to :

Tempo
6100 Columbia Street, Mineral Wells
Texas 76067 USA.
Attention TEST INSTRUMENT REPAIR.

For all Test Instrument repairs outside the Americas; you must first request a Return Authorization Number by contacting our Tempo Europe Customer Service department at +44 1633 225 600. This number must be clearly marked on the shipping label. Ship units Freight Prepaid to:

Tempo Europe Repair Centre
Unit 3, Maesglas Industrial Estate
Newport, South Wales NP20 2NN, UK
Attention TEST INSTRUMENT REPAIR.

For items not covered under warranty (such as dropped, abused, etc.) repair cost quote available upon request.

Note: Prior to returning any test instrument, please check to make sure batteries are fully charged.

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