

TRK-230 MOBILE DISPLAY/GPS TERMINAL



TRK-230

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The TRK-230 is a robust in-vehicle display terminal with an exceptional feature list that interfaces with the CES Wireless GPS-150 vehicle location and asset-tracking unit. The device provides two-way status messaging, text messaging and intelligent automatic vehicle location appended to messages. The driver can navigate through system menus, messages and status keys using intuitive backlit keys. The device provides the fleet manager with the ability to deliver mission critical information to the driver quickly and without error.



Wireless

The TRK-230 interfaces with the CES Wireless GPS-150 providing compatibility with two-way radio, conventional and trunking radio systems.



Superior Design

High quality, robust casing with easy to view high temperature graphical LCD screen.

Easy to use

The TRK-230 features 13 backlit keys that are easily accessible to the driver, and custom programmable to match customers' application.

FEATURES

- **Status Messages:** Up to 10 programmable status messages, each with up to 19 characters of text
- **Predefined Messages:** Up to 50 programmable predefined messages, each with up to 342 characters of text
- **Text Messaging:** 10 messages of up to 342 characters
- **Scroll Keys:** Scroll Up, Down, Left and Right
- **Emergency Key:** Activation sends a emergency signal to base
- **Masking:** Status keys can be masked to force driver to send in logical order
- **Communications:** Two RS-232 serial ports
- **Memory:** 128Kb Flash, 32Kb Eprom, 10Kb RAM

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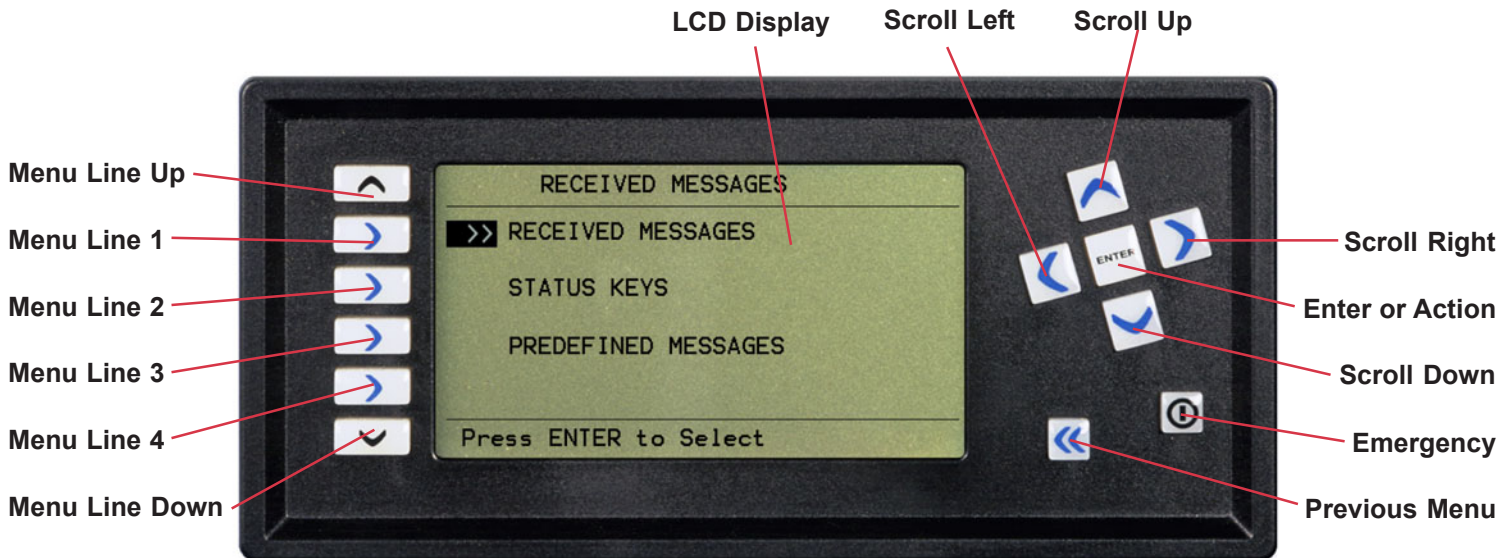
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USER INTERFACE

Interaction between the driver and the TRK-230 is done through the use of menu soft keys and an easy to read LCD display. The TRK-230 is controlled by the use of menu driven screens, where the user is presented with several choices that can be browsed with the front panel keys.

Typically, the user would use the Up and Down keys to move to the desired menu selection. The 'Enter' key would then be pressed to select the menu action. Depending on the selection, either a sub menu or a message screen is displayed.

The main functions of the TRK-230 front panel keys:



Keys

There are a total of 13 soft keys that are accessible to the driver. These keys can be programmed according to the customer's application. The default main menu includes menu, message and status keys. To select an action, the 'Enter' key is used. There is also an Emergency Key dedicated to emergency situations. The following sections describe each key and how they are used.

Menu Line Up Key

This key moves the current menu selection up one line. If already at the top line, no action will be taken.

Menu Line Down Key

This key moves the current menu selection down one line. If already at the bottom line, no action will be taken.

Menu Line Select Keys

This group of four keys is located between the Menu Line Up and Menu Line Down keys. Pressing any of these keys selects the menu line that is adjacent to the key. If no menu line exists at that position, no action will be taken.

Scroll Up Key

When pressed, this key may act in either of the following modes:

1. If a menu is being displayed (including Status Keys), it works the same as the Menu Line Up Key.
2. If a message is being displayed, it works as a Page Up Key.

Scroll Down Key

When pressed, this key may act in either of the following modes:

1. If a menu is being displayed (including Status Keys), it works the same as the Menu Line Down Key.
2. If a message is being displayed, it works as a Page Down Key.

Scroll Left Key

When pressed, this key may act in either of the following modes:

1. If a menu is being displayed (including Status Keys), it works the same as the Previous Menu Key.
2. If a message is being displayed, it will display the previous message. If there are no more messages, no action will be taken.

Scroll Right Key

If this key is pressed while a message is displayed, it will display the oldest message stored in the unit. If there are no older messages, no action will be taken. In other contexts (menu, status keys), no action is taken.

Enter Key

This is the main action key. Pressing this key selects menu options, deletes messages or sends a command.

These are the possible key contexts:

1. **In menu mode** – pressing Enter executes the selected menu option. Usually a submenu is displayed as a result. Other possibilities are the display of messages and status keys.
2. **In message mode** – pressing Enter while in message mode deletes the selected message. A prompt displays asking to confirm the message deletion.
3. **In status keys mode** – pressing Enter while displaying the status keys will trigger the Send Status Keys command. If the selected line is part of the current mask, the line will be sent. Otherwise, an error beep will sound and no message will be sent.

Previous Menu

This key is the 'Go Back' key. This key is used to return to the menu mode from any other context. For example, if the current mode is message mode, pressing this key returns the screen to the previous menu.

Emergency Key

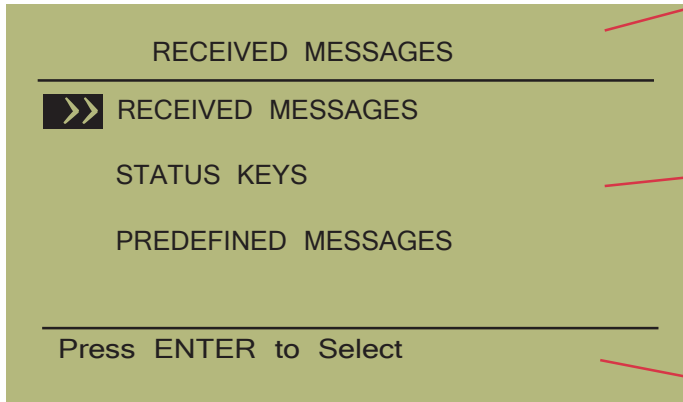
This key sends an Emergency Alert to the base.

LCD DISPLAY

The TRK-230 LCD display is a graphical display that can display up to 6 lines of message text per screen. Each line can hold up to 24 characters. The message limit is three screens per message. Messages longer than one screen length can be browsed (by page) using the Scroll Up and Scroll Down Keys.

For menus, the maximum number of menu lines on one screen is four. Each menu line can hold up to 19 characters of text. For menus containing more than four lines, the scroll keys can be used to browse the different screens.

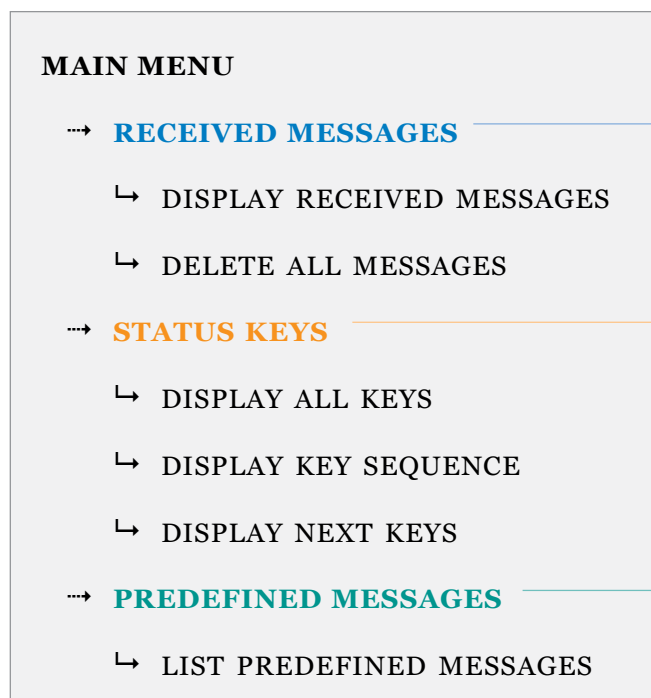
The LCD area is divided into three different areas, separated by horizontal lines:



1. **Title Line** – This line at the top of the screen contains the caption for the current menu line or menu name. Its purpose is to help the user know which selection is active.
2. **Text Area** – This is the center of the screen. This is where menus and messages are displayed. Depending on the context, up to four lines (for menus and status keys) or six lines (for messages) of text can be displayed.
3. **Status Line** – This is at the bottom of the screen. It shows help messages about the current Text Area.

MENU HIERARCHY

TRK-230 user input is done through menu driven screens. The menus are arranged in a top-down hierarchy that is navigated using the left and right keys. To make a selection, the Enter key needs to be pressed. The following table shows the TRK-230 menu tree.



Submenu to handle received messages (predefined and free text messages). User can read and delete received messages.

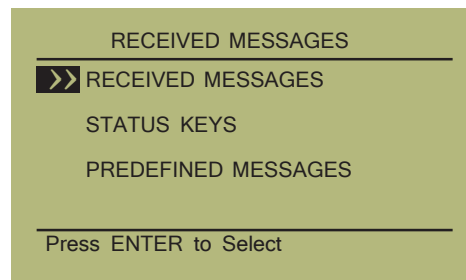
Submenu for Status Keys. The user can send Statuses, check for next available keys, and check the past key sequence.

Submenu where the user can see the predefined messages.

Received Messages

The TRK-230 can store a maximum of 10 messages in nonvolatile memory. Each message can be up to 342 characters in length. These messages can be free form text messages sent by the dispatcher, or predefined messages stored in the unit. If the message storage area gets full, the oldest message is deleted and any new message will be saved.

This submenu contains the following entries:



This is the top menu.



Received Messages sub menu.

◆ **DISPLAY RECEIVED MESSAGES** – Pressing the ‘Enter’ key displays the most recent message received. The left and right arrows (keys) are used to browse backward and forward. The ‘Enter’ key can be used to delete the current message. To exit this area, use the ‘Previous Menu’ Key.

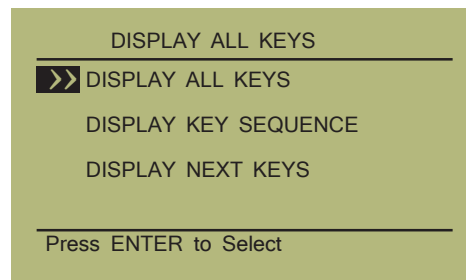
◆ **DELETE ALL MESSAGES** – Pressing the ‘Enter’ key will display a prompt to delete all saved messages. Pressing ‘Enter’ again will delete the messages. The ‘Previous Menu’ key can be used to cancel the action.

Status Keys

Status keys are sent by the driver to the base, indicting the current activity of the vehicle, e.g. In Service, En Route, Loading, Out of Service. The TRK-230 can be configured to send a maximum of 10 different Statuses. The Keys are usually programmed when the unit is first configured. These statuses usually follow a predefined sequence. The sequence logic is configured into the unit when first set up. These Keys, if configured to do so, can include the current GPS information. See the section ‘Functional Parameters’ for more information about Status Key programming.

This submenu contains the following entries:

◆ **DISPLAY ALL KEYS** – Pressing the ‘Enter’ key displays a list of Status Keys. Status Keys are shown one key/legend per line. Each line can have different attributes that designate its current state. A line with reverse background is in an “enabled” state. An enabled key can be pressed to send the Status Key notification associated with that key. A blinking key denotes a key waiting for base acknowledgment. In this state, a status was sent, but the TRK-230 has not received an acknowledgement from the base. A light colored key denotes a key that is in a disabled state. A disabled key does not allow its status be sent next. The ‘Previous Menu’ key is used to return to the submenu.



Status Keys sub menu.

◆ **DISPLAY KEY SEQUENCE** – Pressing the ‘Enter’ key displays the previous keys that have been pressed. From bottom to top, the keys are shown in the order that they were sent. The ‘Previous Menu’ key is used to return to the submenu.

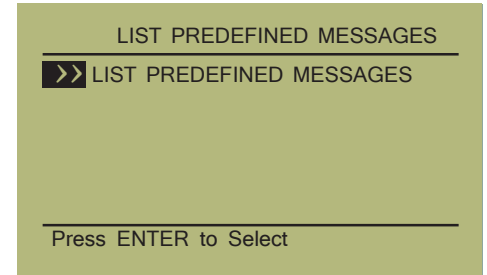
◆ **DISPLAY NEXT KEYS** – Pressing the ‘Enter’ key will display the TRK-230 keys that are currently enabled. In other words, it will show the keys that are masked (enabled) and could be sent next. The ‘Previous Menu’ key is used to return to the submenu.

Predefined Messages

Predefined messages are messages that are stored in the TRK-230 and are displayed when a message trigger is received from the base. Predefined messages are usually configured into the unit when the unit is first being set up.

This submenu contains the following entry:

◆LIST PREDEFINED MESSAGES - Pressing the 'Enter' key displays the predefined messages. Message numbers range from 1 to 50, with message 1 shown first. The user can browse the messages using the Scroll Left and Scroll Right Keys. If a message is longer than one screen length, the Scroll Up and Scroll Down keys can be used to scroll the message. The 'Previous Menu' Key is used to return to the menu.



Predefined Messages sub menu.

TRK-230S Utility

The TRK-230S is the configuration software for the TRK-230. It is a stand-alone program that runs under the Windows® operating system. This program uses a serial connection to the TRK-230 unit. For more information about the TRK-230S, see the related functional spec document.

Functional Parameters

The TRK-230 contains user-defined parameters that are stored in nonvolatile memory. These include predefined messages, status key information, and others.

Predefined Message Parameters

This group can be up to 50 messages. These messages, programmed in using the TRK-230S utility, are stored and displayed when the unit receives a Predefined Message trigger. Each message has a 342 character maximum. When the unit receives a Predefined Message trigger, the associated message is retrieved from memory and displayed on the LCD screen. An audible beep sounds when the message is displayed.

Status Key Parameters

This group is information for the 10 Status Keys. The Status Key information includes caption, notification type, and masking. Functionally, it is the reverse of the Predefined Message process. The Status Key sends a trigger to the base that is associated with a pre-programmed text string, e.g. *On Site*. The user selects the status to send, and the TRK-230 sends the corresponding notification to the base.

Status Keys Caption Parameters

This is the text that is displayed on the Status Key menu. The menu is up to 10 selections (keys) with up to four lines per screen. Each caption can have up to 19 characters of text. The order of the keys in the menu, from top to bottom, is: 1, 2, 3, 4, 5, 6, 7, 8, 9 and 0. These captions are programmed using the TRK-230S software.

UNIT PROGRAMMING

Status Key Notification Type

Each status key contains a notification type parameter. The notification-type indicates if the Status Key should be sent as status only or include GPS information. When the GPS option is selected, the GPS information is added. A mix of command types is possible (i.e. key number one can be status only, key number two can be status plus GPS, etc.). The TRK-230S is used to configure this parameter.

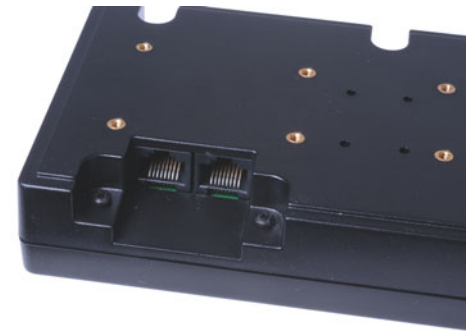
Status Key Masking

This parameter is the sequence allowed when sending status keys. Each status key contains a mask parameter. The mask for a key contains information about which key may be enabled *next*. Programming these masks is the heart of the Status Keys logical sequence. Usually the keys follow a logical order that is determined by regular operation. For example, **Loading** should be followed by **To Job**, **To Job** by **At Site**, and so on. The resulting mask may be only one key, or several keys. The TRK-230S is used to configure the masks.

HARDWARE SETUP

The TRK-230 is a self-contained unit with a minimum of external connections. Currently, the unit contains only two external connectors, both of them for RS-232 serial communication. The two serial ports are labeled '1' and '2', and use RJ-45 connectors (8 pins). Beside the RS-232 communications pins, power for the unit is present in these connectors.

These are the RJ-45 pin-out descriptions (the ports are identical).



Pin	Signal	Description
1	GND	Ground
2	+12VDC	Power Supply Input
3	N/C	
4	Tx	Data Out
5	Rx	Data In
6	N/C	
7	N/C	
8	N/C	
N/C = Not Connected		

Programming Connection

The TRK-230 Functional Parameters are programmed using Serial Port 1 and the TRK-230S Programming Software. A serial connection between the host PC and the unit needs to be setup. The connection uses a three-wire RS-232 connection (Transmit, Receive and Ground). Usually, a DB-9 terminated cable is used at the host end. Notice that +12VDC needs to be fed to the TRK-230, either using this serial port, or the spare serial port 2.

The following table shows the DB-9 pin connections for a serial cable.

TRK-230 RJ-45	DB-9 (Female)	Signal
1	5	Ground
2		*
3		
4	2	TRK-230 Transmit
5	3	TRK-230 Receive
6		
7		
8		

*Note: +12VDC should be applied to RJ-45 pin 2, either using serial port 1 or 2.

GPS-150 Connection

The main purpose of the TRK-230 is to provide a user interface for units that do not have this capability. For the GPS-150, the connection to the TRK-230 is Serial Port 1. The GPS-150 uses one of its peripheral serial ports to talk with the TRK-230. This serial port is available on the DB-25 Radio connector of the GPS-150 unit.

The following table shows cross connections to the DB-25 Radio connector.

TRK-230 RJ-45	DB-25 (Male)	Signal
1	2, 5, and/or 25	Ground
2	1	+12VDC
3		
4	22	TRK-230 Transmit
5	21	TRK-230 Receive
6		
7		
8		

Peripheral Serial Port

Connector '2' is a spare RS-232 serial port that is used to connect other peripherals to the TRK-230. This could include a keyboard, card reader, bar code scanner, etc.

MECHANICAL SPECIFICATIONS

Model:	TRK-230 Mobile Display Terminal
<i>User Interface</i>	
Graphical LCD screen:	160 x 80 pixels 24 Characters x 6 lines 1 line menu bar 12 backlit multi functional soft keys 1 Power on/off key
<i>Environmental/Temperature</i>	
Operating:	-25 to +80 C
Storage:	-40 to +85 C
Supply Voltage:	8 to 16.5VDC
Estimated Current:	MDT on/Backlighting off 50 mA MDT on/Backlighting on 200 mA
Memory:	128KB FLASH, 32KB EEPROM, 10KB RAM
Weight:	226 grams, 0.5lbs
Dimensions:	7.6in x 3.7in x 1.2 inches 193 x 93.1 x 30.5 mm
<i>CES Wireless Part Number's:</i>	
TRK-230 Mobile Display Terminal:	TRK-230
TRK-230 x GPS-150 interface cable:	CABLE57
Heavy Duty Mounting Bracket:	MOUNT03
Universal Programming Software Disk:	CDSOFT1
Optional:	Custom multilingual fonts