3M Dynatel™
EMS-iD Locator 1420

Operators Manual

1420
1420E

CE 0678 ⓘ

January 2004
78-8130-6741-6-D

Congratulations! You have just purchased one of the finest, most advanced EMS locating devices available today!

The 3M™ Dynatel™ Marker Locator 1420 is designed with all of the functionality of previous Dynatel models, and with the enhanced capability to read and write unique user information into the new 3M™ EMS iD Ball Markers 1400 Series. Information such as a pre-programmed unique identification number, facility data, application type, placement date and other details can all be read, stored and transmitted back to your PC for enhanced resource management with this revolutionary equipment. The Dynatel Marker Locator 1420 will also detect two different types of utility markers simultaneously.

We at 3M are dedicated to bringing you premium equipment with outstanding reliability, backed by one of the best warranties in the business, and outstanding service.

Statement of Conformity

"Hereby, 3M Company declares that this Underground Locating Product is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC."
www.3m.com/market/telecom/access/conformity/

Statement of Intended Use

These 3M™ Dynatel™ Advanced Marker and Cable/Pipe Locating Products: 1420E, 2250ME, 2273ME, 2250ME-iD, 2273ME-iD models are designed and tested for use in locating 3M buried markers, utilities and structures. These 3M markers are used to identify buried utilities and structures. The products have not been tested or proven safe for other uses. The use of these products may be subject to licensing restrictions.

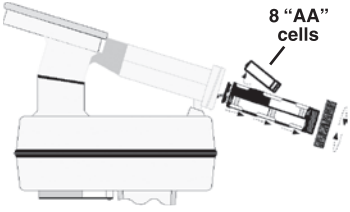
*** WARNING ***

It is unlawful to operate this unit in any country with a configuration setting that is not specific to that country. In order to prevent the user from operating this unit with a configuration setting that is not specific to the country where it is operated, this unit is equipped with configuration software for installing country specific configurations. Please refer to the initial configuration setup sheet.

TABLE OF CONTENTS

QUICK START

Battery Installation



The receiver batteries are tested for two seconds every time the unit is turned on.

The bar graph will fill to the relative battery level.
The Battery Icon [8] on the Locate Screen will continuously indicate the battery level.

CAUTION!

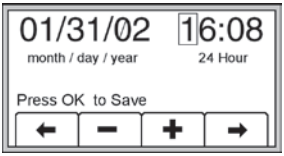
Insure batteries are installed with proper polarity. Do not charge batteries or dispose of them in fire. Batteries may leak or explode and cause personal injury. Always remove batteries when storing the units for long periods of time.

Battery Disposal: Since regulations vary, consult applicable guidelines or authorities for proper disposal.

Setting the Receiver Clock

Set the time, date, and date format of the receiver. Depth and read/write marker information are time and date stamped.

MENU [6] + SETUP [SK] + CLOCK [SK]



Press the left/right arrow [SK] to highlight the digit of the date or time to change.
Press the + or - [SK] to increment or decrement.
When the date format is highlighted, the format will toggle between mm/dd/yy and dd/mm/yy.
Press OK [SK] to save, or Menu [6] to cancel.

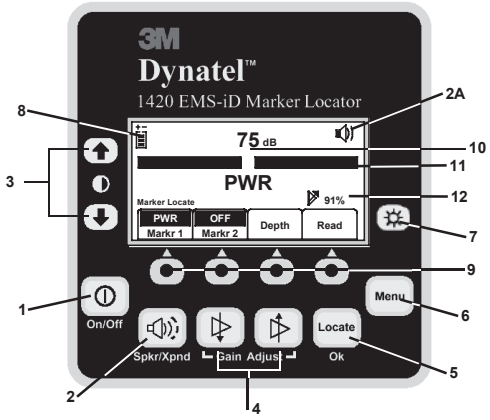


Figure 1

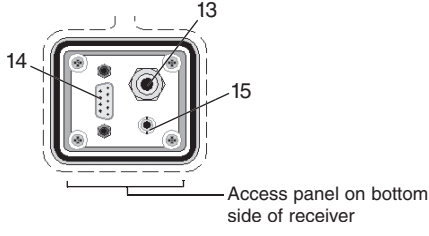


Figure 2

RECEIVER KEY PAD DEFINITIONS

Figure 1

POWER: [1] Turns unit off and on.

SPEAKER: [2] Adjusts the volume of the receiver (off, low, med and high).

SPEAKER ICON [2A]: Indicates the relative volume level of the receiver.

CONTRAST: [3] The arrows located above and below the contrast icon will adjust the contrast of the screen.

GAIN: [4] Adjusts the sensitivity of the receiver either up or down to maintain a satisfactory signal level.

LOCATE/OK: [5] Sets the receiver to trace mode for locating markers. Acknowledges setup entries (OK).

MENU: [6] Displays setup screen for configuration of the unit, i.e.: clock, language, depth units and marker data.

BACKLIGHT: [7] Toggles the backlight low, high, and off.

BATTERY ICON: [8] Indicates battery level.

SOFT KEY: [SK] There are four soft keys on the receiver. The function of each key is shown above the key on the display screen. The functions will change, depending on the operation mode of the receiver. For instruction purposes, the display command is followed by [SK] to identify it as a soft key.

SOFT KEY COMMAND: [9] Definitions for each of the four soft key functions.

SIGNAL STRENGTH: [10] Digital reading of the signal the receiver is detecting.

BAR GRAPH: [11] Graphical representation of the received signal.

GAIN LEVEL: [12] Displays the relative gain level.

Figure 2

EXTERNAL JACK: [13] Not active on this model.

SERIAL PORT: [14] RS232 port to connect the receiver to a PC via straight serial cable (not included).

EARPHONE JACK: [15] Will fit standard 1/8 inch mini-jack mono earphone plug (not included).

CONFIGURING THE RECEIVER

In the setup mode the units of depth measurement, time, date, date format and language can be set. The receiver can be configured to detect specific utility markers.

Selecting Depth Units

MENU [6] + Setup [SK] +Units [SK]

Press Units [SK].

The soft key command will toggle between inches (in), centimeters (cm), and feet/inches (ft-in).

Selecting a Language

MENU [6] + Setup [SK] + Lang [SK]

The soft key command will cycle through all available languages.

ELECTRONIC MARKERS AND EMS-ID MARKERS

E-Model Initial Configuration

Attention: All E-Model / iD Locators must run the initial configuration setup found in the 3M™ Dynatel™ Locator PC Tools software.

Activating the Marker Locate Feature

In order to enable the electronic marker location feature of this receiver, you must identify the country in which the locator will be used. This initial configuration is required for the 2273ME-iD, 2250ME-iD, and 1420E locator receiver models.

Some countries do not allow all marker operating frequencies. Therefore, the E-Model locators are shipped with all the marker types/frequencies disabled.

***** WARNING *****

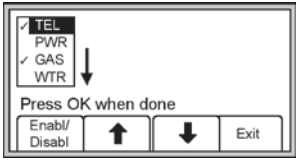
It is unlawful to operate this unit in any country with a configuration setting that is not specific to that country. In order to prevent the user from operating this unit with a configuration setting that is not specific to the country where it is operated, this unit is equipped with configuration software for installing country specific configurations.

Initial Configuration

- Install the software provided on the enclosed CD. (3M™ Dynatel™ Locator PC Tools)
- Close any programs that may be using the COM ports.
- Start the software program.
- Connect the receiver to the PC via the RS232 serial cable.
- Turn the receiver on.
- From the main screen, select the country in which the unit will be operating. (If the country is not listed, select “All other countries”.)
- A communication window will appear. (Baud rate 38400 / Com Port 1) Press OK.
- Press Initial Configuration.
- Press Download.
- Prompt line will display: Download Completed Successfully
- Multiple units may be configured, at this point by simply connecting the next receiver, turning it on, and pressing download.
- Press Exit when all units have been configured.

Enabling/Disabling MarkerTypes

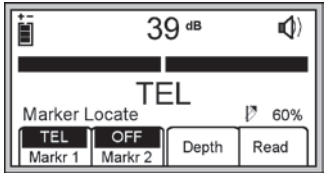
MENU [6] + SETUP [SK] + Marker Type [SK]



The unit will default with all markers enabled (✓).
Press the up/down arrows [SK] to highlight a utility to enable or disable.
Press Enabl/Disabl [SK].
Only the markers that are enabled (✓) will be available in the locate mode.
Press OK [5] to save settings or Exit [SK] to cancel.

Locating EMS Markers

Single Marker Locate



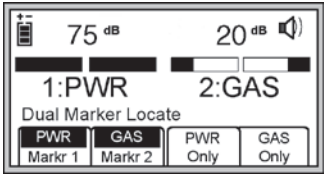
Press Locate [5]
Press Markr 1 [SK Toggle] to select desired utility.
Markr 2 should be OFF.

Note: Only the marker types enabled in the setup menu will be shown. (See Enabling/Disabling Marker types).

Adjust the Gain Down [4] until the bar graph opens.
The bar graph will close, the audio will be steady, and the signal strength will be maximum when the receiver detects a marker of the specified utility.

Dual Marker Locate

Press Locate [5].



Press Markr 1[SK Toggle] to select desired Utility.
Press Markr 2[SK Toggle] to select desired Utility.

Note: Only the marker types enabled in the setup menu will be shown.

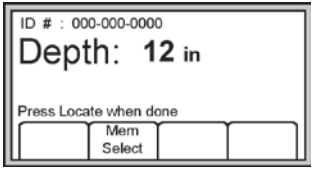
The third and forth soft key commands will populate with the types of utilities selected for Marker 1 and Marker 2.
Adjust the Gain Down [4] until the bar graphs open.
The bar graph will close, the audio will increase, and the signal strength will be maximum when the receiver detects a marker of the specified utility.

When one of the two markers is detected, press the “XXX Only” [SK] for the detected utility marker.
The unit will switch to Single Marker Locate in order to pinpoint the marker.
Press Markr 2 [SK Toggle] to return to Dual Marker Locate.

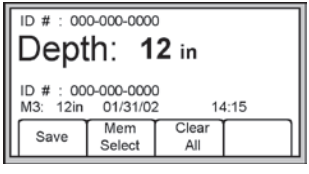
Marker Depth Estimate

iD Marker Depth

Lower the tip of the receiver to the ground over the targeted marker.
Press Depth [SK].
The receiver will examine the marker (Calculating signal, please wait...)
If the marker is an iD marker:
The receiver will display the depth of the marker, and its identification number.



Five depth readings can be saved with the time, date, and its identification number.
To save the depth reading, press Mem Select [SK].



Save [SK] will place each entry in sequential order in memory (M1 - M5) until five readings have been stored. The unit will overwrite saved entries in excess of five, beginning with M1.

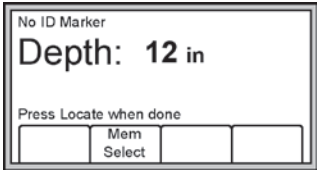
Press Clear All [SK] to delete all stored depth information.

The operator may select the memory location to store the depth readings by pressing Mem Select [SK]. When the preferred location appears on the screen, press Save [SK]. The screen and memory location will populate with the current information.
Each memory location can be reviewed by pressing Mem Select [SK].
Press Locate [5] to return to Marker Locate Mode.

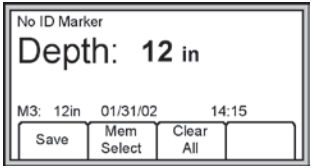
If a 3M™ iD marker is detected, but the surrounding conditions are noisy, or there is more than one marker present, the Unit will display "???" instead of the identification number of the marker in the Depth Screen. To retrieve the data from the marker, press Read [SK] from the marker locate screen. (See Reading iD Markers)

Depth of Passive, Non-iD Marker

Lower the tip of the receiver to the ground over the targeted marker.
Press Depth [SK].
The receiver will examine the targeted marker. (Calculating signal, please wait)
The screen will instruct the operator to raise the unit 6 inches (15.2 cm) from the ground.
Raise the unit 6 inches and press Depth [SK] again.
Press the Depth [SK] key again. The estimated depth of the marker from ground level will display on the screen.



Five depth readings can be saved with the time, and date.
To access the memory locations, press Mem Select [SK].



Save [SK] will place each entry in sequential order in memory (M1 - M5) until five readings have been stored. The unit will overwrite saved entries in excess of five, beginning with M1.

Press Clear All [SK] to delete all stored depth information.

The operator may select the memory location to store the depth readings by pressing Mem Select [SK Toggle]. When the preferred location appears on the screen, press Save [SK]. The screen and memory location will populate with the current information.
Each memory location can be reviewed by pressing Mem Select [SK Toggle].
Press Locate [5] to return to Marker Locate Mode.

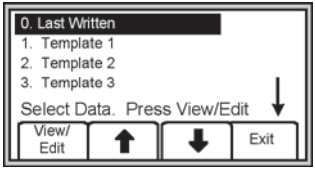
Reading 3M™ iD Markers

The operator can retrieve the data from the iD marker by pressing Read [SK] (on the locate screen or the depth screen).
The receiver tip should be lowered to the ground to reach maximum read depth.
All the information retrieved from the marker, including the date and time read, is saved into the 'Read History' file of the receiver. (See Reviewing Marker History)

Writing iD Markers

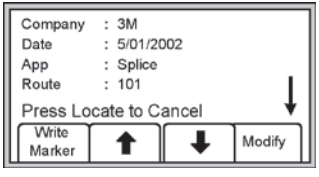
The write mode enables the user to write or program information into 3M™ EMS iD markers 1400 Series. It is also possible to edit the information to be programmed.

MENU [6] + WRITE MODE [SK] +

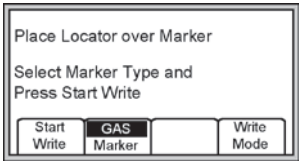


Select a template from the list on the screen, to program into the marker by pressing the up/down arrows [SK] to highlight the preferred template. 'Last Written' is the most recent data that was programmed to a marker by the receiver.

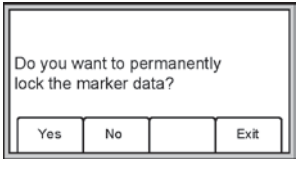
Press View/Edit [SK].



The screen will display the information from the selected template. The arrow on the right side of the screen indicates there is more information than can be displayed on the screen (scroll down by pressing the down arrow [SK]).
Enter user information that will be written to this marker. (See Editing Marker Data.)
Verify all information is correct.
Press Write Marker [SK].



Select type of marker to be written [SK Toggle].
Hold the receiver directly over the top of the marker. The receiver should be within 12 inches (30 cm) of the marker.
Press Start Write [SK].

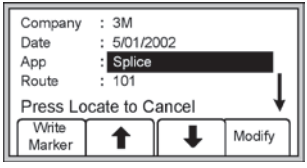


The receiver will ask if the user wants to permanently lock the marker data. Select Yes [SK] or No [SK]. The receiver will write the data to the marker.

Note: Once the marker data has been locked the information contained on the marker is PERMANENT.

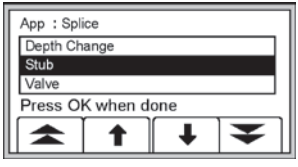
Editing Marker Data to be Programmed

To alter the information to be programmed into the marker
Press Menu [6] + Write Mode [SK].
Select a template from the list on the screen, to program into the marker by pressing the up/down arrows [SK] to highlight the preferred template. “Last Written” is the most recent data that was programmed to a marker by the receiver.
Press View/Edit [SK].

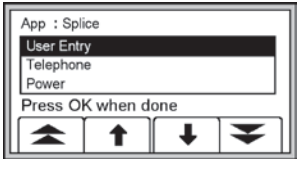


Press the up/down arrows [SK] to highlight the information to change.
Press Modify [SK].

The operator has two options from the modify screen.

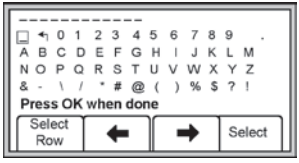


Option #1: Select a term from the list by pressing the up/down arrows [SK].
Press OK [5].



Option #2: Manually enter information by selecting “User Entry”.
Press OK [5].

If User Entry is selected, the following screen will appear.



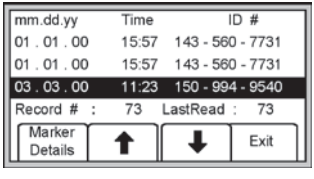
Move the boxed cursor to the 'back arrow' and press Select [SK] to delete the entry to be modified.
Move the boxed cursor by pressing the left/right arrows [SK] or Select Row [SK] to move the cursor to the next row.
Press Select [SK] to enter the alphanumeric character.
Entry will appear at the top of the screen.
Press OK [5] when entry is complete.
Press Write Marker [SK] to program the target marker.
To cancel press Locate [5].

Reviewing Marker History

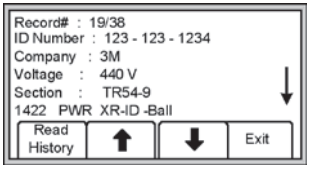
Read History

The data review Read history mode is a historical file of all information that has been read from targeted markers (100 memory locations).

MENU [6] + DATA/TEMPLAT [SK] + Read History



The Read History screen displays the date and time that each marker was read, and its unique identification number.
Select the marker data to be viewed by pressing the up/down arrows [SK]
Press Marker Details [SK] to view all data that was retrieved from the marker.

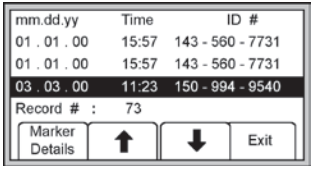


Press Read History [SK] to return to list or
Press Exit [SK] to return to data review screen.

Write History [SK]

MENU [6] + Data Templat [SK] + Write History

Select the marker data to be viewed by pressing the up/down arrows [SK].



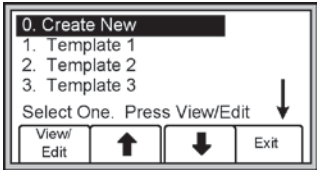
Press Write Details [SK] to view all data that was sent to the marker.
Press Write History [SK] to return to the list of programmed data.
Press Exit [SK] to return to data review screen.

Creating/Editing Templates for 3M™ iD Markers

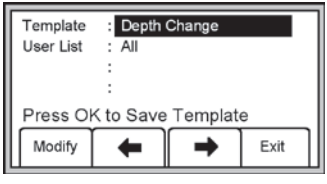
In the User Template screen, the operator can create and modify templates to program iD markers.

Creating New Templates

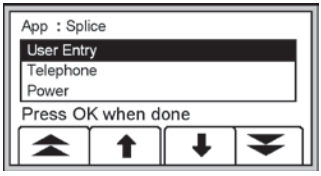
MENU [6] + Data/Templat [SK] + User Templat [SK]



Select create new or a preprogrammed template by pressing the up/down arrows [SK].
Press VIEW/EDIT [SK].

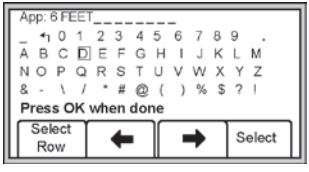


If creating a new template, name the template.
Press Modify [SK] to populate, or edit a field.



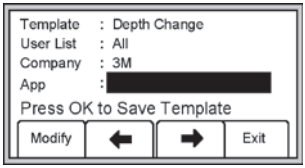
Select from a list of labels and terms, or choose User Entry (manual alphanumeric entry).

If user entry is selected, the following screen will appear.



Move the boxed cursor by pressing the left/right arrows [SK] or Select Row [SK] to move the cursor up or down.
Press Select [SK] to enter the alphanumeric character.
Entry will appear at the top of the screen.
Press OK [5] when entry is complete.
Press Write Marker [SK] to program the target marker.
Press Locate [5] to cancel.

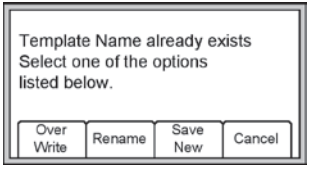
Note: To clear the previous field entry, select the "back arrow" with the cursor and delete the previous entry.



Navigate through the fields on the screen using the left/right arrows [SK]. Press OK [5] to save the template.

Editing Templates

The operator can select an existing template and makes changes to it in the same manner describe in Creating Templates. The following save screen will appear.



Over Write: Saves all modifications that have been made to the original template.

Rename: Overwrites the old template with the new name and all modifications. Screen will return to the template name field. Modify the name of the template and press OK [5] to save.

Save New: Creates a new template containing all information. Original template remains unchanged. Screen will return to the template name field. Modify the name of the template and press OK [5] to save.

Cancel: Clears all modifications made to any unsaved template.

Note: User templates can also be created on a PC using 3M™ Dynatel™ Locator PC Tools software and then downloaded to the receiver via the RS232 port [13] on the unit.

HELP MODE

MENU[6] + More>> [SK] + Help [SK]

The help screen contains basic information about the unit and its operation. It is designed to be a quick reference guide.
Press the double up/down arrows [SK] to navigate between sections.
The single up/down arrows [SK] will scroll the screen line by line.

3M™ DYNATEL™ LOCATOR PC TOOLS

The Dynatel Locator PC Tools is a software program for the computer. It allows the user to transfer Read/Write iD marker data to PC files, create templates and term lists to copy to the locator, configure the receiver (frequencies, units, etc), and perform software upgrades.

Please refer to operating instructions included with the software.

SELF TEST OF RECEIVER

MENU [6] + MORE>>[SK] + Self Test [SK]

This operation performs a self-test on the receiver.
The receiver will display current information about the unit (model number, serial number, software revision, and hardware revision).
Press RUN [SK] to start the self test.
A status bar will appear while the self test is running.
Results will appear on the screen when the test is complete.

Specifications (1420, 1420E)

Frequencies / Markers	
General Purpose, Communication, Gas, Telephone	
Water, Waste Water, Power	
Search Range	Refer to Marker specifications
Read Range: (XR-iD Ball Markers)	
Model: 1420 All Types	5 ft (1.5 m)
Model: 1420E All Types except Power	4 ft (1.2 m)
Model: 1420E Power Marker	40 in (1 m)
Program Range XR/iD Ball Markers	1 ft (30 cm)
Marker depth accuracy	+/- 15% +/-2 in (5 cm)
Dual Marker Locate Mode:	Any 2 marker types
Weight w/ Batteries:	4 pounds
Average Battery Life:	20 Hours

Note: The battery life is measured at 73F/23C, with 5% usage of the backlight at normal level and audio set to medium level.

The ratio of Marker Read operations to Marker Locate is assumed to be 1:1.

CE 0678 !

CE This product is in accordance wit the requirements of the European directive 99/5/EC

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