

3M EMS-ID Electronic Markers Introduction and Guide to PCTools

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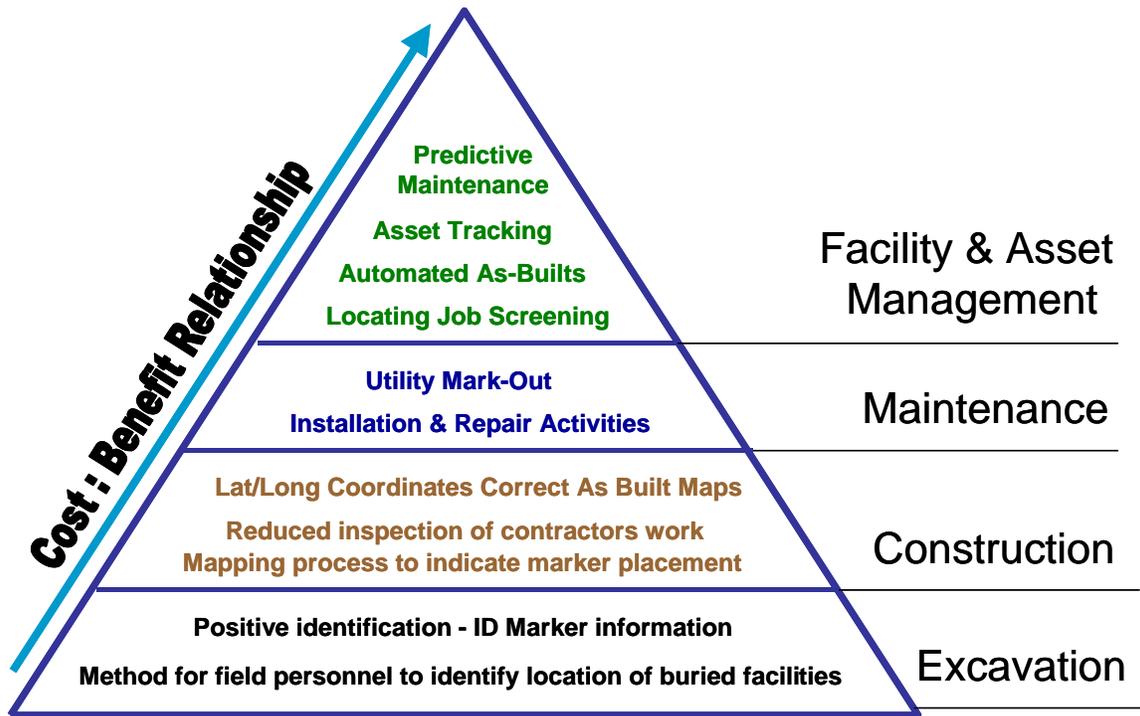
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1.0 Developing an ID marking plan

1.1 Deciding what you want to mark

Take some time to identify what you are trying to accomplish in the immediate implementation. The most basic benefit of ID marking is to provide a reliable method for field personnel to identify the location of buried facilities. More advanced applications are possible using Dynatel™ PCTools software or various GPS mapping solutions.



1.2 What to program into the ID Marker

The memory of the ID Marker is limited. When deciding what information to program into the marker, we recommend to include only that information that is necessary for field personnel to confirm that they are on the correct facility and it's description.

1.3 What are user templates

In simple terms user information is stored in the ID marker in up to six lines of information, each line contains one question and one answer. In mapping systems, these may be called properties and values or feature attributes. The building block in the Dynatel system is called a user template. Each user template is created to describe a repeatable facility item that typically has a marker placed on it. Additional templates can be made to fine tune the template to specific field conditions such as material types or facility sizes. Up to 32 unique templates can be stored in the locator.

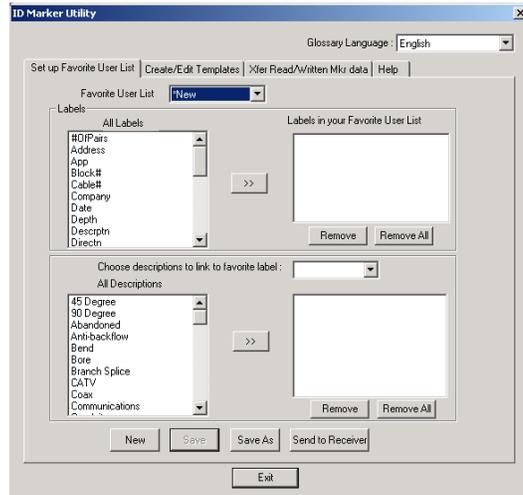
1.4 Getting Started – using Dynatel locator PCTools

Using PCTools the following sequence of steps are recommended:

- Define favorite user list and download to locator
- Define templates and download to locator
- Upload of 'read marker' or 'programmed marker' data from loctor

1.4.1 Favorite user list overview

In the ID Marker Utility – click on the left tab, 'Set up Favorite User List'

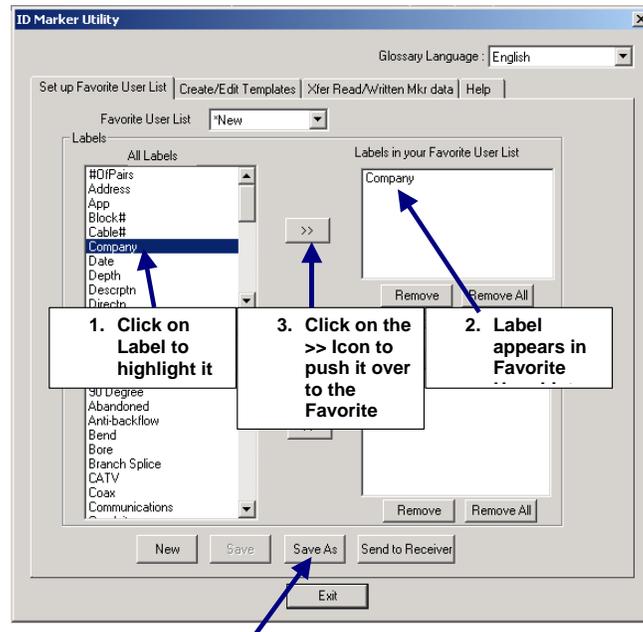


All Dynatel M-iD or 1420 Model locators are able to read ID markers of all utility types. In order to simplify the user interface for customers who only use one type of utility, the favorites list provides an opportunity to remove the Labels and Descriptions that do not apply to their utility and to further customize their interface to only include the ones that they choose to use in their application. 3M has created favorites lists in PCTools for each of the basic utility types to provide examples of how this works.

| <u>Labels</u> | Telephone | CATV | Power | Water | Wastewater | Gas | Gen Purpose |
|---------------|-----------|------|-------|-------|------------|-----|-------------|
| #Of Pairs | x | | | | | | |
| Address | x | x | x | x | x | x | x |
| App | x | x | x | x | x | x | x |
| Block# | x | x | x | x | x | x | x |
| Cable# | x | x | x | | | | |
| Company | x | x | x | x | x | x | x |
| Date | x | x | x | x | x | x | x |
| Depth | x | x | x | x | x | x | x |
| Descriptn | x | x | x | x | x | x | x |
| Direction | x | x | x | x | x | x | x |
| Grid | | | | | | | x |
| IPID# | x | | | | | | |
| Job# | x | x | x | x | x | x | x |
| Location | x | x | x | x | x | x | x |
| Person | x | x | x | x | x | x | x |
| Permit | | | | | | | x |
| PSI | | | | | | x | |
| Record # | x | x | x | x | x | x | x |
| Route# | x | x | x | x | x | x | x |
| Size | x | x | x | x | x | x | x |
| Thickness | | | | x | | x | |
| Type | x | x | x | x | x | x | x |
| Use | x | x | x | x | x | x | x |
| Utility | | | | | | | x |
| Utl Xing | | | | | | | x |
| Voltage | | | x | | | | |

1.4.2 Creating a Favorite User List

You can create a favorite user list your favorite labels using the ID Marker Utility in PCTools by first highlighting and then 'pushing' the highlighted labels over from the box on the upper left to the box on the upper right. Multiple labels can be selected at one time and pushed over all at once.



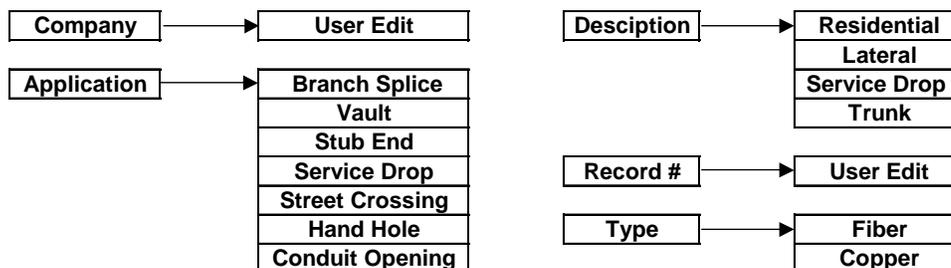
It is important that after making your selection of favorite labels that you then save the favorites list by clicking on the 'Save As' icon. A box will appear on the screen prompting you to name the favorite list. The name is limited to 5 characters.

1.4.3 Linking Favorite Labels to Descriptions:

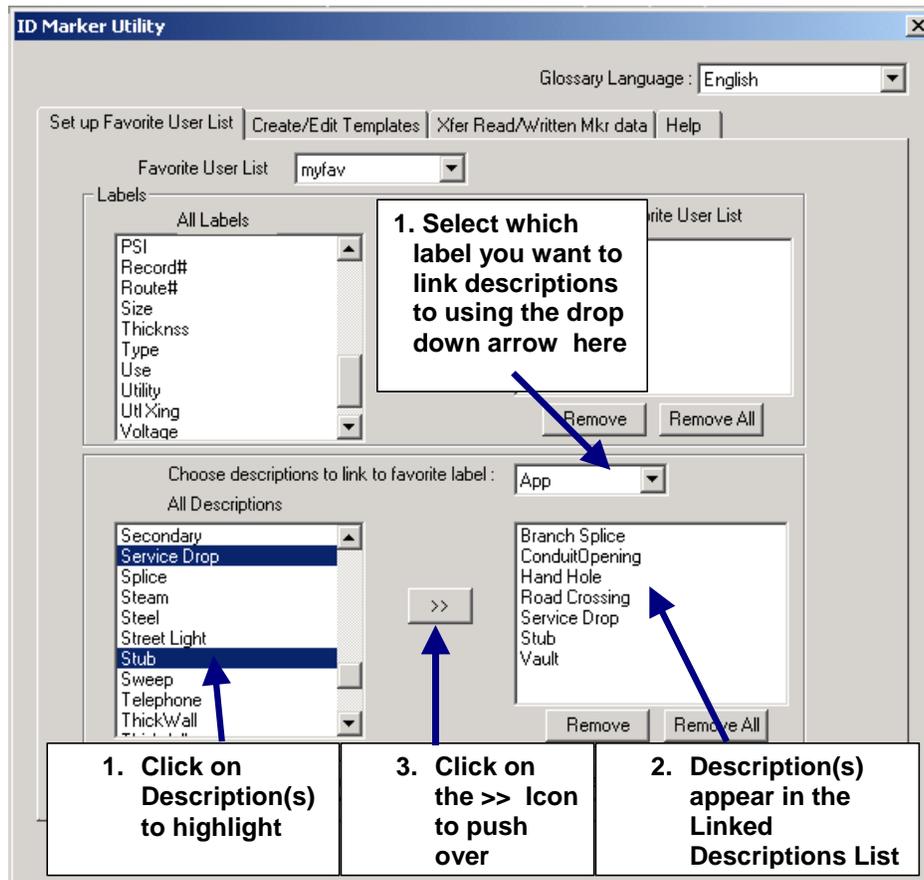
After you have chosen a list of labels that you would like to use and saved that as a Favorite User List, you may want to further simplify your user interface by linking each Favorite Label to a group of descriptions that you want associate with that specific label. This establishes your chosen descriptions as the 'multiple choice' options for a specific label when creating or editing templates on both the PCTools Program and on the Locator.

To give you an idea how this works, we will use an example below.

If you chose favorite labels of Company, Application, Description, Record# and Type for a typical Telco type of application, you might want to set up your links as follows:



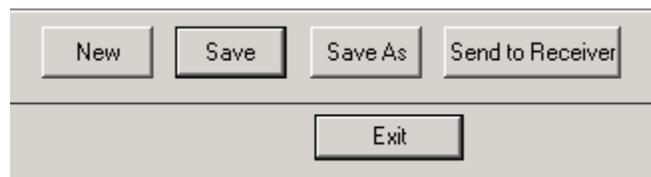
Here's how you would do this in PC Tools



Now that you have created a Favorite User List and linked labels to specific descriptions its time for you to save your work one more time by clicking on the Save Icon at the bottom of the screen.

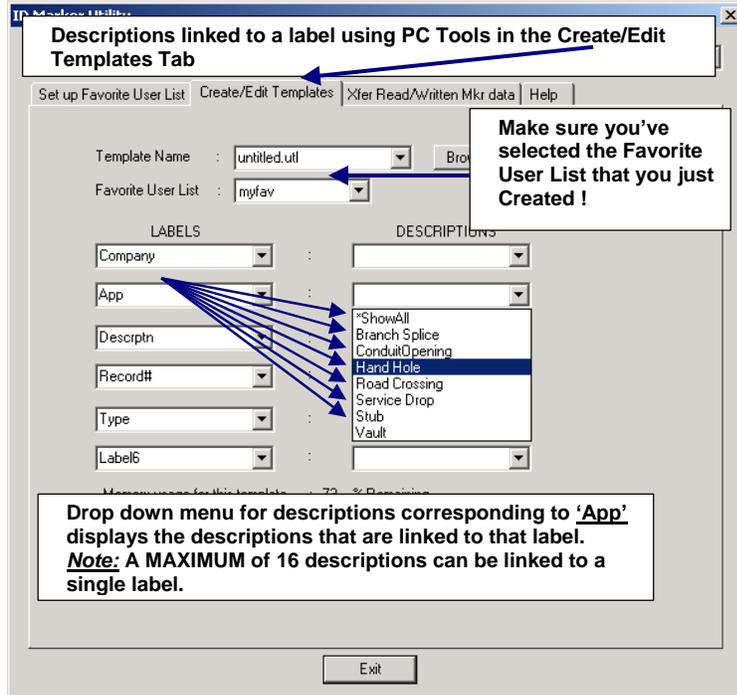
The next (and final) step is to send these to your Receiver. To do this

1. Plug in the serial cable from your computer to the Receiver
2. Turn on the Receiver
3. Click on the Send to Receiver Icon at the bottom of the screen and wait while this information is sent to the receiver.



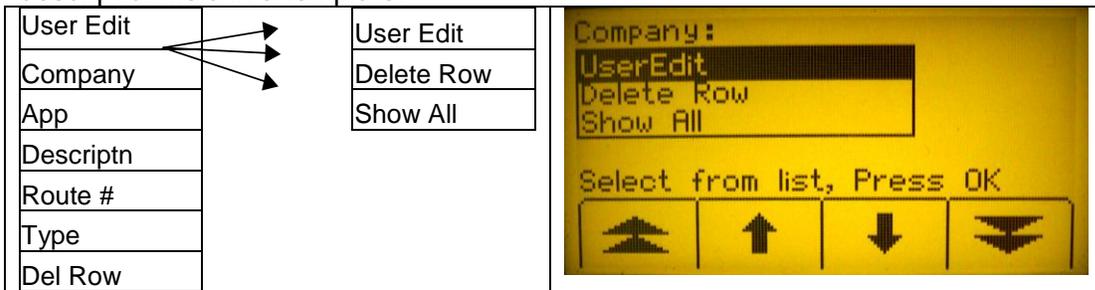
1.4.4 Creating templates using PCTools using a Favorite User List.

Lets see how this works for PCTools when creating of modifying templates. First select the Create/Edit Templates tab in the ID Marker Utility



1.4.5 Use of Favorite User list on receiver

When Descriptions have been linked to labels and downloaded to the receiver, these descriptions will appear as the multiple choice options when modifying or editing a description field in a template.



Favorite Labels with Descriptions Linked



Note: PC Tools can accommodate many Favorite User Lists but the locator can only store 1 Favorite User List at a time.

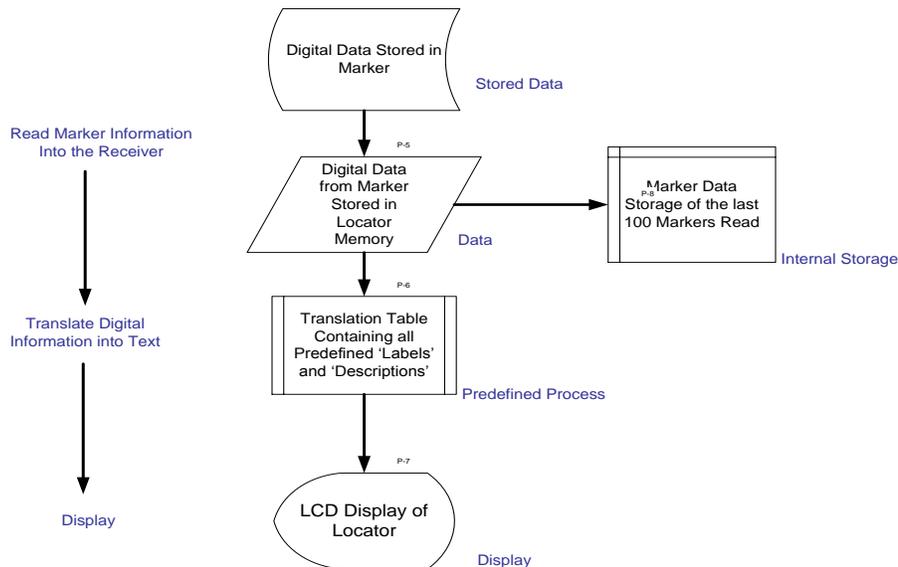
1.5 'Compressed' data

The data that is stored into the ID Marker is in a digital format. When the locator reads the information that is stored into the marker it translates from this digital format to an alphanumeric format that can be read. So when the locator reads a string of digital data it goes to a 'Translation Table' to translate this digital data to something that we can understand. This translation will either be a standard Label, Description or just a standard Alphanumeric character if it was something that you typed in manually. What is important to keep in mind is that the same amount of marker memory is required to write each unique piece of information and that a single Alphanumeric character will consume about the same amount of memory as a standard Label or Description

Example of what happens in the 'Translation Table'

| Digital Data String | English Translation | Spanish Translation |
|---------------------|---------------------|---------------------|
| 1101101 | Splice | Empalme |
| 1001100 | Stub | El Talonario |
| 1000100 | A | A |
| 1010011 | B | B |

The flowchart below gives you an idea of how this information goes from the buried ID Marker to what you see on the display of the receiver.



1.5.1 Memory Usage

There is enough memory on a marker to accommodate a combination of +/- 25 pieces of information depending on how it is entered. The table below shows how memory is allocated:

| | Label | Description |
|------------------------|-------|-------------|
| Compressed Word | 6% | 6% |
| Typed in Letter | | |
| First Character | 9% | 4% |
| Second Character On | 4% | 4% |
| Typed in Number | | |
| First Number | 9% | 4% |
| Second Number On | 4% | 4% |

1.6 Template Design

In setting up templates for the first time here are some things to consider:

- The unit will store up to 32 different templates in it, you may consider creating separate templates for each possible configuration to eliminate a need for editing of templates in the field.
- You might want to trade off having more lines of information and have fewer lines of information that can accept more freely typed information.
- Are you going to make one basic template for all of your ID Markers or are you going to make separate templates for each basic application? For example: Stub, Splice, Valve, Path, Lateral etc....
- If you elect to have one standard template for all applications, you may want to insure that you have created a Favorite User List and have linked Descriptions to the Favorite Labels to create a multiple choice menu on the locator if templates need to be edited in the field.

1.6.1 Template Format

Templates consist of up to 6 lines of information. There are 6 labels which are limited in length to 8 characters. There are 6 Descriptions which are limited in length to 14 characters. Standard Labels and Descriptions can be accessed by using the drop down menu's or words, numbers and abbreviations can also be typed in

1.6.2 Creating Templates

Launch PCTools and click on the icon ID Marker Utility, select the Create/Edit Template tab.

The screenshot shows the 'Create/Edit Template' interface. On the left, a list of six numbered instructions is provided. Blue arrows point from these instructions to corresponding UI elements in the screenshot:

- 1. Select your favorite user list → points to the 'Favorite User List' dropdown menu.
- 2. Use the drop down menus to select your labels → points to the 'Label1' dropdown menu.
- 3. Use the drop down menu to select the corresponding descriptions. → points to the 'DESCRIPTIONS' dropdown menu.
- 4. On fields where you need to enter unique information, you can directly type that in. → points to the text input field for 'Label3'.
- 5. If you choose to have 'Company' as a label, you may want to consider abbreviating your company name to 2 or 3 letters to conserve memory. → points to the 'Label1' dropdown menu.
- 6. Click on the 'Save As' icon and name your template with a name that can be recognized as to what it is intended to mark. → points to the 'Save As' button.

The interface includes the following elements:

- Template Name : untitled.utl [Browse]
- Favorite User List : All
- LABELS: Label1, Label2, Label3, Label4, Label5, Label6
- DESCRIPTIONS: [dropdown menu]
- Memory usage for this template : 100 % Remaining
- Buttons: Clear, Save As, Download Template(s)

- Selecting labels from the drop down box saves memory space allocated for the marker data. If you chose to enter a label that is not included in the predefined lists, be aware that each character entered will reduce amount of information that can be programmed.
- Add descriptions of the labels in the right side of the template. Selecting predefined descriptions from the 'show all' drop down list will allow more information to be programmed into the marker.
- Remaining memory space for marker data is indicated below the template screen.