TMS Plus Series

Operator’s Manual

CE

Issue 1.0 **053-2833**

ORIGINAL INSTRUCTION

Foreword

Foreword

Read this user's guide before using this software. Keep it available at all times for future reference. If you need a replacement copy, contact your Ditch Witch® distributor.

The descriptions and specifications in this guide are subject to change. Subsite® Electronics reserves the right to improve this product. Some product improvements may have taken place after this guide was published. For the latest information on Subsite Electronics products, see your Ditch Witch dealer.

Thank you for buying Subsite Electronics equipment.

User's Guide
TMS Plus

Issue number 1.0/OP-05/15
Part number 053-2833

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Introduction

Welcome

The Trac Management System Plus (TMS Plus) is designed to help professional directional drilling operators be more productive.

This software can be used to plan the bore before drilling in the first drill pipe. Variables such as topography, surface features, and existing underground utilities are easily included in the model. After defining the environment, the software applies engineering variables such as entry point, entry angle, depth, exit angle, and exit point. The software then graphically simulates a pipe-by-pipe plan for the bore.

TMS Plus also integrates with Subsite Electronics' directional drilling tracking system to allow you to record information about every drill pipe drilled. The system includes a full line of beacons, the 750/752 Tracker, and the 750/752 Display or the 8500 Tracker and 8500 Display.

Data such as depth, roll, pitch, beacon battery status, and beacon temperature displayed at the operator's station on the 750/752 Display or 8500 Display can be downloaded into the computer by pressing a button on the display. Estimated drill pipe data can be entered manually to fill in gaps where walkover tracking is not possible. As-drilled and as-installed maps of the bore can be printed on demand in color or black and white. The map can then be given to the facility owner for future reference. Bore information can also be downloaded from the 750/752 Display or 8500 Display directly into a job file to present either an as-drilled or as-installed report.

Getting Help

This user's guide provides a reference to the functions and commands of TMS Plus.

Find a Help topic

- Click the **Contents** tab to browse through topics by category.
- Click the **Index** tab to see a list of index entries and then type the word you're looking for or scroll through the list.
- Click the **Find** tab to search for words or phrases that may be contained in a Help topic.

Print a Help topic

- Click the **Print** button to print out the Help topic.

- Right-click and select **Print Topic** from the popup menu.

System Requirements

To use TMS Plus, we recommend the following:

- PC, 512 MHz or faster, running Microsoft Windows 2000, XP, or Vista
- 256 megabytes or more of RAM
- CD-ROM drive
- Pointing device (i.e. mouse or touchpad)
- Enabled serial port

If you do not have an enabled serial port, you will need one of the following:

- Serial I/O PC card and serial port adapter (preferred)
- USB serial port adapter

Equipment Compatibility

TMS Plus will work with the any of the following Subsite Electronics products:

- Subsite 66TKRW/90D
- Subsite 750/752 Tracker and Display
- Subsite 8500 Tracker and Display

Personnel Qualifications

To use TMS Plus, you should be familiar with personal computers. Someone familiar with personal computers should be able to:

- Send email.
- Use Microsoft Word to write a letter.
- Use Internet Explorer or another web browser.

Getting Started

Registering your TMS Plus Software

We encourage you to register your TMS Plus software as soon as you've installed it onto your system. By registering your software, you are entitled to the following services:

- Product support
- Advance notification of new product updates

Understanding TMS Plus

Getting started on TMS Plus is as easy as creating or opening a word processing file and entering information. To get the most out of your TMS Plus experience, it is important to know the program and its components.

Control Panel

When TMS Plus is activated, the **Control Panel** will appear. It is the main hub from which all other components extend like wheel spokes, providing one place to access all program components.

Use **Settings** to set your preferences for language, font, date and time display, and units of measurement.

Click on **Download** to activate the **Download Wizard**, a step-by-step procedure for downloading jobs from your 750/752 Display or 8500 Display into TMS Plus.

In **Plan**, you can access the **Job Panel**, the main work area of TMS Plus.

For help, click on **User's Manual** to access the *TMS Plus User's Guide*.

End your TMS Plus work session by clicking on **Exit**.

Layers

In TMS Plus, you enter specific job information into a specific layer. For example, enter topography information into the **Topography** layer. Each layer builds onto the previous layer, forming a complete planned path, pilot bore path, or as-installed map and report. The layers are organized in the **Layer Manager** and displayed on the **Planning Grid**.

Job Panel

The **Layer Manager** and **Planning Grid** are the main components of the **Job Panel**. They work together in planning and mapping job information. The **Layer Manager**, located on the left-hand side of the screen, displays the name, type, connection, and visibility status of each layer.

You can connect a 750/752 Display or 8500 Display to either a **Pilot Bore** or **Backream** layer to receive real-time pipe information directly. You can also select which layers to hide or show for display on the **Planning Grid**. The **Planning Grid**, located on the right-hand side of the screen, displays the bore map.

The **Job Panel** has six menus available to perform various program functions like adding a layer to a job or zooming in on a portion of the map. To perform commands, click on the needed menu and then click on the command or use the keyboard shortcut.

File Menu

Command	Description	Shortcut
New	Begins a new job	Press **Ctrl+N**
Open	Opens a new job with a different file name	Press **Ctrl+O**
Save	Saves all changes to the job file	Press **Ctrl+S**
Save As	Saves the job file with a different file name	Press **Alt+S**
Export	Saves the job file into a CAD drawing or image (JPEG or PNG) file format	Press **Ctrl+E**
Page Setup	Specifies the page size and orientation for printing	Press **Ctrl+G**
Print	Prints the job file to a connected printer	Press **Ctrl+P**
Exit	Exits from TMS Plus	Press **Ctrl+X**

Edit Menu

Command	Description	Shortcut
Undo	Removes the last entry or function entered into job file	Press **Ctrl+Z**
Add Item	Adds a point to the selected layer on the **Planning Grid**. Point is determined by the away, lateral, elevation and depth measurements	Press the **Insert** key
Delete Item	Removes a specific point from the **Planning Grid** and **Layer Properties**	Press the **Delete** key
Edit Item	Edits item properties	Press the **F3** key
Next Item	Moves to the item right of the currently selected item	Press the **Right Arrow** key
Previous Item	Moves to the item left of the currently selected item	Press the **Left Arrow** key
Job Properties	Opens the **Job Properties** menu where the optional job name can be edited	Press the **F2** key
Grid Properties	Opens the **Grid Properties** menu where the grid volume can be adjusted	Press **Ctrl+F2**
Units	Changes the measurement units	Press **Ctrl+U**

Layer Menu

Command	Description	Shortcut
Add Layer	Adds a new layer to the job file	Press **Ctrl+Insert**
Delete Layer	Removes a layer and all items in that layer from the job file	Press **Ctrl+Del**
Edit Layer	Edits layer properties	Press **Ctrl+F3**
View Layer	Displays layer report for the selected layer	Press **Ctrl+Space**
Next Layer	Moves to next layer in the **Layer Manager**	Press the **Down** arrow key

Previous Layer	Moves to the previous layer in the **Layer Manager**	Press the **Up** arrow key
Import Layer	Imports data from an external source (such as a download file) into a layer	Press the **F4** key
Export Layer	Exports data from a layer into either a DXF or CSV file format for use in an external application	Press **Ctrl+F4**

Wizards Menu

Command	Description	Shortcut
Bore Planning	Invoke either the **Critical-Point Bore** or **Grade** Bore wizard	Press **Ctrl+B**
Entry Reversing	Invoke the **Entry Reversing** wizard to swap Entry and Exit points	Press **Ctrl+R**

View Menu

Command	Description	Shortcut
Zoom In	Enlarges item size on **Planning Grid**	Press the **F5** key
Zoom Out	Reduces item size on **Planning Grid**	Press the **F6** key
Zoom Layer	Displays entire selected layer on **Planning Grid**.	Press the **F7** key
Fit Width	Fits all layers within the **Planning Grid**	Press **Alt+F7**
Go To …	Centers specific area on **Planning Grid**.	Press the **F8** key
Grid	Displays or hides the grid lines in **Planning Grid**.	Press the **F9** key

Help Menu

Command	Description	Shortcut
User's Manual	Opens the *TMS Plus User's Manual*.	Press the **F1** key
About	Displays the software version of TMS Plus.	Press **Ctrl+F1**

Exiting TMS Plus

When exiting TMS Plus, you will be prompted to save changes before closing the file.

Product Support

Call **1-800-846-2713** for TMS Plus support. Outside of the U.S., call **0+11+ 580-572-3700**.

Setting Preferences

Language

Use the **Language** menu to select between German, French, Spanish, Italian, Russian, Simplified-Chinese, and English languages.

Change language

1. From the **Control Panel**, click **Settings**.
2. Click the **Language** box arrow and select language.
3. Click **OK**.

Font

Use the **Font** menu to change the font or appearance of text in the program.

Change font

1. From the **Control Panel**, click **Settings**.
2. Click the **Change** button.
3. In the **Font** list, select a new font.
4. In the **Font Style** list, select a new font style.
5. In the **Size** list, select a new font size.
6. In the **Effects** area, click **Strikeout** or **Underline** if necessary.
7. Click **OK**.

Unit of Measurement

Use the **Units** menu to select between English or Metric units. You can also select the number of decimal places to display.

Change the unit of measurement

1. From the **Control Panel**, click **Settings**.
2. On the **Settings** menu, click the **Units** tab.
3. In the **Length Unit** box, click **Metric** or **US Feet**.

4. In the **Precision** box, type or select the number of decimal points to display. Click the arrows to see options.
5. Click **OK**.

Date/time Format

Use the **Date/Time** menu to select the way the date and time appear on printed job sheets.

Change the date/time format

1. From the **Control Panel**, click **Settings**.
2. On the **Settings** menu, click the **Date/Time** tab.
3. Under **Date Format**, select the appearance of the day, month, and year.
4. Under **Time Format**, select the appearance of the hours, minutes, and seconds.
5. Click **OK**.

Plan Bore

Preparation

A successful job begins before the bore. The first step in planning is reviewing information already available about the job and jobsite.

Job Plan

Review blueprints or other plans and make sure you have taken bore enlargement during backreaming and pullback into account. Check for information about existing or planned structures, elevations, or proposed work that may be taking place at the same time.

One-Call Services

Call area One-Call or similar services and have existing lines located and marked. Call any utilities in your area that do not subscribe to One-Call.

Pullback Material

Ask for a sample of the material you will be pulling back. Check its weight and stiffness. Contact the manufacturer for bend radius information. Check that you have appropriate pullback devices.

Traffic Control

If working near a road or other traffic area, contact local authorities about safety procedures and regulations.

Inspect Site

Inspect jobsite before planning bore. Check for the following:

- Overall grade or slope
- Changes in elevation such as hills or open trenches
- Obstacles such as buildings, railroad crossings, or streams
- Signs of utilities
- Traffic
- Access
- Soil type and condition
- Water supply
- Sources of locator interference (rebar, railroad tracks, etc.)

Take soil samples from several locations along bore path to determine best bit and backreamer combinations.

Identify Hazards

Identify safety hazards and classify jobsite.

Jobsite hazards could cause death or serious injury. Use correct equipment and work methods. Use and maintain proper safety equipment.

NOTICES:

- Notify One-Call and companies which do not subscribe to One-Call.
- Verify location of previously marked underground hazards.

Remember, jobsite is classified by hazards in place -- not by line being installed.

Select Start and End Points

Select one end to use as a starting point. Consider the following when selecting a starting point:

Slope

Fluid system should be parked on a level site. Consider how slope will affect drilling unit set-up, bending pipe, and fluid flow out of hole.

Traffic

Vehicle and pedestrian traffic must be a safe distance from drilling equipment. Allow at least 10 ft (3 m) buffer zone around equipment.

Space

Check that starting and ending points allow enough space for gradual pipe bending.
Check that there is enough space to work and to set up Electric Strike System.

Comfort

Consider shade, wind, fumes, and other site features.
Drill downhill when possible so fluid will flow beyond the drilling unit.

Plan Process

You must plan the bore path from entry to end before drilling begins. Bore information, such as entry point, entry angle, minimum bend radius, maximum depth, and exit point, is used to create a TMS Plus bore plan and map.

In creating this plan, enter the topography, surface features, and obstacles to provide a true representation of the job site. Then enter the entry point, exit point, and maximum depth to create a proposed pilot bore path.

NOTICE: Follow all safety precautions listed in the drilling unit operator's manual.

IMPORTANT: TMS Plus cannot predict changes in bore path caused by sudden changes in soil conditions, improper drill head steering, incorrect drill pipe data, or missing drill pipe data. Subsite Electronics assumes no responsibility for improperly entered variables. Always verify entered data.

Create a new job

1. From the **Control Panel**, click **Plan**, and then select **New File**.
2. In the **File Name** box, enter a filename.
3. Click **OK**.
4. In the **Job Name** box, enter a job or location name.
5. Click **OK**.

Open an existing job

1. From the **Control Panel**, click **Plan**, and then select **Existing File**.
2. In the **Open** menu, select file.
3. Click **OK**.

Add Topography Information

Use the **Topography** layer to enter changes in surface elevation caused by ditches, hills, rivers and ponds. These all provide valuable reference points when the program plans the bore.

Add topography

1. Create new job or open an existing one.
2. In the **Layer Manager**, double click on **Topography** to open the **Survey Properties** menu.
3. In the **Layer Name** box, type in a new layer name, then click **OK**.
4. Click on the **Draw** tool, then click on the **Planning Grid** to add first point.
5. In the **Properties** menu:
   - Click in **Away**, then type in the away measurement.
   - Click in **Lateral**, then type in the lateral measurement.
   - Click in **Elevation**, then type in the elevation measurement.
6. Click **OK**.
7. Repeat steps 4 – 6 to add next point.

Add Features

Use the **Line** or **Image** layer to create the *surface* features of the job plan. Surface features include roads, rivers, lakes, trees, buildings or anything that is above ground that is near the planned bore or backream path.

Add a line layer

1. Click on the **Add Layer** icon.
2. Select **Line** from the **New Layer** menu.
3. In the **Layer Properties** menu, type in a layer name.
4. Click the **Feature Properties** tab.
5. Click in the **Line Width** box, type in a line width from 1 (thinnest) to 10 (thickest), then press **Enter**.
6. Click **Edit Color** button to change line color, select the new line color, then click **OK**.
7. Click **OK**.
8. Click on the **Draw** tool, then click on the **Planning Grid** to add first point.
9. In the **Properties** menu:
   - Click in **Away**, then type in the away measurement.
   - Click in **Lateral**, then type in the lateral measurement.
   - Click in **Elevation**, then type in the elevation measurement.
10. Click **OK**.
11. Repeat steps 8 – 10 to add next point.

Add an image layer

1. Click on the **Add Layer** icon.
2. Select **Image** from the **New Layer** menu.
3. In the **Image Properties** menu, type in a layer name, then click **OK**.
4. Click on the **Draw** tool, then click on the **Planning Grid** to add point.
5. In the **Properties** menu, under the **Position** tab:
   - Click in **Away**, then type in the away measurement.
   - Click in **Lateral**, then type in the lateral measurement.
   - Click in **Elevation**, then type in the elevation measurement.
6. Click the **Image** tab.
7. Click the **Open File** button, select file, and then click **OK**.
8. Click **Preview** tab to view image.
9. Click **OK**.
10. If necessary, click on the **Move** tool, then click and hold the image anchor and drag to the appropriate location.

Add Obstacle Information

Use one of the **Obstacle** layers to enter information for any underground communications, electric, gas, sewer, or water obstacle.

Add obstacle

1. Click on the **Add Layer** icon.
2. Select the type of obstacle layer to create from the **New Layer** menu.
3. In the **Obstacle Properties** menu, type in a layer name.
4. Click in **Diameter**, then type in the obstacle diameter.
5. Click in **Minimum Clearance Zone**, then type in the minimum clearance zone.
6. Click **OK**.
7. Click on the **Draw** tool, then click on the **Planning Grid** to add first point.
8. In the **Properties** menu:
   - Click in **Away**, then type in the away measurement.
   - Click in **Lateral**, then type in the lateral measurement.
   - Click in **Depth**, then type in the depth measurement.
9. Click **OK**.

Label Map

Use a **Text** layer to label the map or to add your notes to the job plan.

Add text

1. Click on the **Add Layer** icon.
2. Select **Text** from the **New Layer** menu.
3. In the **Text Properties** menu, type in a layer name, then click **OK**.
4. Click on the **Draw** tool, then click on the **Planning Grid** to add point.
5. In the **Properties** menu, under the **Position** tab:
   - Click in **Away**, then type in the away measurement.
   - Click in **Lateral**, then type in the lateral measurement.
   - Click in **Elevation**, then type in the elevation measurement.
6. Click on **Notes** tab.
7. Type text into the box.
8. Click the **Change Font** button to change the font style. If no changes are needed, click **OK**.
9. Click the **Change Color** button to change font color. If no changes are needed, click **OK**.
10. Click the **Preview** tab to view text.
11. Click **OK**.

12. If necessary, click on the **Move** tool, then click and hold the text anchor and drag to the appropriate location.

Enter Plan Information

Use the **Plan** layer to enter the entry point, exit point and maximum bore depth. These three items, along with the topography, features, and obstacles, create a sequence of target points that the drill string must go through.

After placing the target points, the proposed pilot bore or backream path is mapped using the minimum pipe or product bend radius and length information.

IMPORTANT: If **red** appears in any portion of the planned path, this indicates that the bend radius has been exceeded. Adjust the entry point, exit point or depth to remove the red.

You have two options for bore planning: use the Bore Planning Wizard or enter the plan parameters yourself. The easiest and fastest way to plan bores is to use the Bore Planning Wizard, especially when planning a grade bore.

You can modify plan parameters to avoid obstacles by adding or removing target points and by editing the target point properties.

Start Bore Planning Wizard

1. Click on the **Wizards** menu.
2. Select **Bore Planning**.
3. When the Bore Planning Wizard appears, click on either the Critical-Point Bore tab (to plan based on a desired depth at one critical point) or the Grade Bore tab (to plan a grade bore).
4. Follow wizard directions to plan the bore.

Enter plan parameters

1. In the **Layer Manager**, double-click on **Plan** to open the **Plan Properties** menu.
2. In the **Layer Name** box, type in a new layer name, then click **OK**.
3. Click on the **Draw** tool, then click on the **Planning Grid** to add entry point.
4. In the **Properties** menu:
   - Click in **Away**, then type in the away measurement.
   - Click in **Lateral**, then type in the lateral measurement.
   - Click in **Depth**, then type in the depth measurement.
   - Click in **Pitch**, then type in the pitch measurement.
   - Click in **Yaw**, then type in the yaw measurement.
5. Click **OK**.
6. Repeat above steps to add a maximum depth point and an exit point.

7. Draw proposed bore path:
    - Click on **Add Layer** icon.
    - Select either **Pilot Bore** or **Backream** from the **New Layer** menu.
    - In the **Layer Properties** menu, type in a layer name.
8. If necessary, enter length, diameter and bend radius of pipe or product.
9. If **red** appears in any portion of the proposed path, return to the **Plan** layer to adjust the entry point, exit point or depth until **red** is removed.

Create pilot bore layer

1. Click on the **Add Layer** icon.
2. Select **Pilot Bore** from the **New Layer** menu.
3. Under **Layer Name** in the **Bore Properties** menu, type in a layer name.
4. Click in **Pipe Length**, then type in the pipe length.
5. Click in **Diameter**, then type in the pilot bore diameter.
6. Click in **Minimum Bend Radius**, then type in the minimum bend radius.
7. In **Attributes**, select the properties to display in the layer report.

Create backream layer

1. Click on the **Add Layer** icon.
2. Select **Backream** from the **New Layer** menu.
3. Under **Layer Name** in the **Backream Properties** menu, type in a layer name.
4. Click in **Pipe Length**, then type in the pipe length.
5. Click in **Diameter**, then type in the backream path diameter.
6. Click in **Minimum Bend Radius**, then type in the minimum bend radius.
7. In **Attributes**, select the properties to display in the layer report.

Print

1. From the **File** menu, select **Print**.
2. Select item to print.
3. Click printer icon to print.

Modify plan parameters

Add target point

1. Select **Plan** from the **Layer Manager**.

2. Click on the **Draw** tool, then click on the **Planning Grid** to add new target point.
3. In the **Properties** menu:
    - Click in **Away**, then type in the away measurement.
    - Click in **Lateral**, then type in the lateral measurement.
    - Click in **Depth**, then type in the depth measurement.
    - Click in **Pitch**, then type in the pitch measurement.
    - Click in **Yaw**, then type in the yaw measurement.
4. Click **OK**.

Remove target point

1. Select **Plan** from the **Layer Manager**.
2. Click on the **Erase** icon.
3. Click on the point to delete in the **Planning Grid**.
4. Click **Yes**.

Modify target point

1. Select **Plan** from the **Layer Manager**.
2. Click on the point to modify.
3. Modify target point properties.

Record Bore

Plot Pipes

When TMS Plus is connected to a 750/752 Display or 8500 Display, pipes can be plotted onto the **Planning Grid**. When not connected, stored jobs can be downloaded into TMS Plus from the display and then downloaded into a layer to create a pipe-by-pipe map.

IMPORTANT: If you have not planned the bore using TMS Plus, you must first enter an entry point into the pilot bore or an exit point into the backream layer.

Plot pipes while connected

IMPORTANT: If you have not planned the bore using TMS Plus, you must first enter an entry point into the pilot bore or an exit point into the backream layer.

1. Press **On**/**Off** button on display to shut down the display.
2. Plug display cable into the download connection port located on or near the drilling unit's operator station.
3. Plug display cable into serial port (750/752 Display) or USB port (8500 Display) of your computer.
4. From the **Layer Manager**, double-click on the layer to add pipes into ***or*** add a layer.
5. Select the icon that matches the Display (90D, 750/752 or 8500).
6. Select the **Serial Port #** (for 90D or 750/752) or **virtual Serial Port** (for 8500) that the display is connected or virtually mapped to. For virtual USB Serial Ports, use Windows Device Manager to discover COM and LPT Ports.
7. Click **Connected** in **Bore Properties** menu.
8. Click **OK**.
9. Press **On**/**Off** button on display to turn power on to the display.
10. When the **Initialized** message appears on your monitor, click **OK**.
11. For 90D and 750/752 Displays: Press and release **Store** to plot pipe on **Planning Grid**.
    For 8500 Displays: Use the on-screen menu and buttons to store pipes on **Planning Grid**.

NOTE: If the depth measurement is incorrect or not taken from directly above the beacon (i.e. locating over a creek), then deselect **Walkover Mode** from **Properties** menu.

Plot stored pipes

1. Open the **Download Wizard**:

   From the **Control Panel**, select **Download**. Follow the instructions to download stored pipes.
   NOTE: To create a *.750 compatible file from an 8500 Display, follow the 8500 Display on-screen instructions.

2. Create a new job or open an existing one.
3. From the **Layer Manager**, click on the layer to add pipes into or add a layer.
4. Click the **Import** button.
5. Select the previously downloaded .750 Display file created by the Download Wizard.
6. Click **OK**.

Reporting

View Reports

Each TMS Plus job is made up of a map and a report. When you create a layer, a report file is automatically generated containing the layer attributes. These measurements are displayed in the report. Reports can be printed out or saved as an HTML file.

There are seven reports to choose from:

Topography

Report attributes include the Away, Lateral, and Elevation measurements.

Plan

Report attributes include the Away, Lateral, Elevation, Depth, Pitch, and Yaw measurements.

Bore

Report attributes are determined by selecting properties found in the **Bore Properties** menu.

Backream

Report attributes are determined by selecting properties found in the **Bore Properties** menu.

Pipe Number

Report attributes include Away, Lateral, Depth, Pitch and Deflection measurements.

Obstacles

Report attributes include Diameter, Minimum Clearance Zone, Away, Lateral, Depth, and Elevation measurements.

Features

Report attributes include Away, Lateral, and Elevation measurements, the File Name or Caption.

View a report

1. From the **Layer Manager**, select the layer to view.
2. Press **Ctrl** + **Space**.
3. Click the **Done** button to close report.

Print a report

1. From the **Layer Manager**, select the layer to print.
2. Press **Ctrl**+**Space**.
3. Click the **Print** button.
4. In the **Print** menu, choose a printer and click **Print** or **OK**.
5. Click the **Done** button to close report.

Save report as an HTML file

1. From the **Layer Manager**, select the layer to save.
2. Press **Ctrl**+**Space**.
3. Click the **Save (Disc)** button.
4. In the **Save As** menu, select the directory to save file to and enter a filename.
5. Click **Save** or **OK**.
6. Click the **Done** button to close report.

How Do I…

How Do I…

- Plan a grade bore?
- Draw and print an as-drilled map?
- Draw and print an as-installed map?
- Remove items and layers from the job file?
- Add a pipe to a plotted map?
- Move a previously stored point to the correct place?
- Map my bore once it is started?
- Change my measurement units?
- Change the Planning Grid size?
- Put my logo on the map?
- Bring my TMS 2.1 pilot bore information into a TMS Plus file?
- Use a TMS Plus file in another planning package?

Plan a grade bore?

Use the Grade Bore Planning Wizard.

Draw and print an as-drilled map?

1. Create a new job or open an existing one.
2. Add **Topography** layer.
3. Add a **Features** layer as necessary.
4. Add an **Obstacle** layer as necessary.
5. Add a **Pilot Bore** layer.
6. Plot pipes or plot stored pipes.
7. Print map.

Draw and print an as-installed map?

1. Create a new job or open an existing one.
2. Add **Topography** layer.
3. Add a **Features** layer as necessary.

4. Add an **Obstacle** layer as necessary.
5. Add a **Backream** layer.
6. Plot pipes or plot stored pipes.
7. Print map.

Remove items and layers from the job file?

Remove items

1. Click on the **Erase** icon.
2. Click on the point to delete in the **Planning Grid**.
3. Click **Yes**.

Remove layers

1. Click on the layer to delete in the **Layer Manager**.
2. Click on the **Delete Layer** icon.
3. Click **Yes**.

Add a pipe to a plotted map?

1. Select the **Bore** or **Backream** layer to add pipe into.
2. Press the **Insert** key.
3. In the **Pipe Number Properties** menu, select **Walkover Locate**.
4. Click in **Depth** and type in depth measurement.
5. Click in **Pitch** and type in pitch measurement.
6. Click in **Yaw** and type in yaw measurement.
7. Click in **Pipe Length** and type in pipe length measurement.
8. Click **OK**.

Move a previously stored point to the correct place?

1. Select the point to be removed.
2. In the **Properties** menu, select **Manual Locate**.
3. Click in **Away** and type in away measurement.
4. Click in **Lateral** and type in lateral measurement.
5. Click **OK**.

Map my bore once it is started?

1. Create a new job or open an existing one.
2. Add **Topography** layer.
3. Add a **Pilot Bore** layer.
4. Add point.

Change my measurement units?

1. From the **Edit** menu, select **Units**.
2. Click on **Length Units** arrow and select either **Metric** or **US Feet**.
3. Click on **Precision** arrows to select number of decimal places to display.
4. Click **OK**.

Change the Planning Grid size?

1. From the **Edit** menu, select **Grid Properties**.
2. Click in **Grid Size**, then select new size.
3. Click **OK**.

Put my logo on the map?

1. Click on the **Add Layer** icon.
2. Select **Image** from the **New Layer** menu.
3. In the **Layer Properties** menu, type in a layer name, then click **OK**.
4. Click on the **Draw** tool, then click on the **Planning Grid** to add point.
5. In the **Properties** menu:
   - Click in **Away**, type in the away measurement, then press **Enter**.
   - Click in **Lateral**, type in the lateral measurement, then press **Enter**.
   - Click in **Elevation**, type in the elevation measurement, then press **Enter**.
6. Click the **Image** tab.
7. Click the **Open File** button, select file, and then click **OK**.
8. Click **Preview** tab to view image.
9. Click **OK**.
10. If necessary, click on the **Move** tool, then click and hold the image anchor and drag to the appropriate location.

Use a TMS Plus file in another planning package?

Pilot bore layers and/or backream layers created in TMS Plus can be exported into different file formats for use with other planning systems. An AutoCad (.dxf) file or a comma separated variable (.csv) file for use with GIS packages or Microsoft Excel can be created from a TMS Plus job plan.

Export a job plan

1. Click **Export** button.
2. Enter a new file name in the **File Name** box.
3. Select either **.dxf** or **.csv** from **Save As File Type** box.
4. Click **OK**.

Glossary of Terms

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Away
The measured distance along the reference line.

Depth
The vertical distance from the surface to the transmitter

Drill string
The combined assembly of components including, but not limited to, drill pipe, tool head, and/or beacon housing connected to the drilling unit.

Elevation
The vertical dimension above/below sea level.

Entry angle
The angle between the drill pipe and the ground with the machine in the operating or working position.

Entry point
Also called punch-in, zero, or base point, this represents the point the drill string enters the ground. It is the zero point for all other measurements.

Exit angle
Angle between the drill pipe and the ground at the exit point.

Exit point
The point at which the drill pipe exits the ground or enters the exit pit.

Features
Above-ground objects that are points of interest, i.e. highways, railroads, rivers, buildings, etc.

Grade
Inclination measurements expressed in either degrees or percent.

Lateral
The measured distance perpendicular to the reference line.

Manual locate
The process of identifying a known beacon position in TMS Plus based on away and lateral measurements.

Minimal bend radius
The calculated bend limit of the specified drill string or installed product during the drilling operation.

Obstacles
Underground such as existing pipes, concrete pillars, boulders, or cable.

Pilot bore path
The centerline location of the pilot bore.

Pitch
The measured inclination of the transmitter.

Target points
Defined points along the planned path.

Topography
The configuration of the ground surface including changes in elevation and the position of natural and man-made features.

Walkover mode
The process of taking a depth and pitch measurement from a known elevation while standing directly over the beacon.

Yaw
The right or left angle away from the reference line.