OPTIMAL RANGING
UTILITY SURVEY
TRIMBLE ACCESS PARTNER APPLICATION

UNDERGROUND UTILITY LOCATING SOLUTION
The Utility Survey application by Optimal Ranging adds a powerful solution into the Trimble Access family of applications. It enables detection and collection of 3D positions of underground utilities in real time from within Trimble Access.

The Utility Survey solution combines an Optimal Ranging Spar 300 receiver using a model based signal detection principle with the Trimble Access module; thus, enabling a user to locate and record geospatial positions of utilities with associate position quality metrics.

LINE MODE
In line mode a known frequency gets applied to any kind of conductive material with an active signal Transmitter.

The radiated signal of the utility gets received by the Spar 300 and visualized in Trimble Access Utility Survey (3D position) as well as FieldSens View (signal strength and confidence).

Feature codes can be measured while walking close to the utility; the map will visualize Spar 300 position, utility position as well as measured feature codes.

SONDE MODE
The sonde mode is another approach to detect utility lines if no conductive material is available (e.g. with plastic or concrete pipes).

A sonde transmits a signal while being pushed/pulled through any kind of pipe; a 3D geospatial position can be estimate without moving the Spar 300.

DUAL SPAR
If the range of a single Spar 300 is not enough there is the possibility to combine spars to a network.

With the dual spar approach the range increases up to 10m to 15m.

OUTPUT AND REPORTS
In addition to the support of the Trimble Access jxl format to visualize data in Trimble Business Center (TBC) it’s also possible to export dxf and ASCII csv files (e.g. to process data in AutoCAD).

Optimal Ranging Utility Survey:
Measure underground utility positions
Estimate a 3D geospatial position with a confidence cloud around the target
Collect feature codes while measuring the utility and export them to TBC.
**OPERATING MODES**

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<tr>
<th>FEATURE</th>
<th>DETAILS</th>
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| Line    | - Apply a signal taken from a signal generator to a conductive material  
|         | - Measure the 3D geospatial position of the utility  
|         | - Visualize both Spar 300 and utility position in the Trimble Access map  
| Sonde   | - Push/pull a sonde through a pipe  
|         | - Measure the 3D geospatial position of the sonde without moving the Spar 300  
|         | - Visualize the sonde in the Trimble Access map  
| Dual Spar | - Increase the range of a single Spar  
|         | - In line mode up to 15m radius around the utility  
|         | - In sonde mode up to 24m (depending on the sonde signal strength)  

**SPAR 300 SPECIFICATIONS**

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| Frequency | 32, 50, 60, 98, 100, 120, 128, 491, 512, 577, 640, 982, 1520, 8192, 8440, 9820 Hz  
| Sensitivity | 500 μA to 10 A at 1 meter  
|            | 25 μA to 500 mA at 1 meter  
| Depth     | 3 meters (single-spar)  
|           | 15 meters (dual-spar)  
| Depth Accuracy (1-σ) | 5% of radial distance relative to spar (typical)  
| Geographic Accuracy (3-D) | ≤ 5cm RTK Fix, depending on reported depth and centerline accuracy  

**REQUIREMENTS**

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| Controller | - Supported controllers:  
|            | o TSC3  
|            | o GeoXR  
|            | o Trimble Tablet  
| Languages | - Supported languages:  
|           | o English  
|           | o German  
|           | o Others on request  

**TYPICAL USE CASES**

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<th>USAGE</th>
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| Locating companies | - Companies that do a lot of utility location jobs and are used to signal strength based positioning systems  
| Surveyors | - Surveyors that want to grow into the locating market and are familiar with General Survey and the workflows  
|           | - Surveyors who already have Trimble Access and GNSS receivers and want to grow business  
| Utility dependant users, cities and communes | - Power and gas companies as well as cities and communes that have survey crews used to locate and map their utility lines  

**BUYING GUIDE**

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<tr>
<th>OPERATING MODE</th>
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| Single Spar    | - Required Equipment:  
|               | o Spar 300 kit  
|               | o Signal Generator  
| Dual Spar      | - Required Equipment:  
|               | o 2 x Spar 300 L1 kits  
|               | o Signal Generator  
| Sonde          | - In addition to one or more Spars:  
|               | o Sonde  