



WebSteering

Stay ahead of the drill bit

Release Notes for GVERSE WebSteering 2016.1.4



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Introduction

LMKR is pleased to announce the release of the GVERSE™ WebSteering 2016.1.4 software. This document provides an introduction to the WebSteering software features and benefits. It also lists the system requirements necessary to install and run the software.

What is GVERSE WebSteering?

GVERSE WebSteering software is designed specifically to help geoscientists geosteer horizontal wells in thin pay zones and to direct the bit in real time.

The GVERSE WebSteering software installs into the web browser with a few button clicks. Then it's a simple process to load LWD and surveys from the rig, add type logs and subsurface grids from GeoGraphix®, and start steering. At any point during this process, LWD data can be sent back to GeoGraphix for further analysis using GeoGraphix's feature-rich suite of tools. GVERSE WebSteering runs even when disconnected from your corporate network so whether you are in the office or working remotely, you can define your target surface and send updated drilling targets to the rig. The WebSteering software is part of the GVERSE application suite by LMKR (<http://www.lmkr.com/gverse>).

LMKR GVERSE consists of geoscience and engineering solutions focused on workflow optimization and enhancing productivity of teams working on diverse geological and geophysical projects. These applications help cut the processing time required for interpretations resulting in fast, easy to use scalable tools that are inter-operable with other known geoscience software suites; enabling a connected multi skilled workforce.

Main Features

The main features of the WebSteering software are as follows:

- A web-based software designed to work when it is connected to a GeoGraphix server as well as when it is not.
- Ability to help geologists build a more accurate target surface that can be used to drill the next well.
- This software can also be connected to a WITSML Server. Therefore, data loaded from the rig can be directly saved to GeoGraphix.
- Easy installation.
- Technical Geosteering based on Relative Stratigraphic Depth concepts (no distortion like vertical section projection).
- Capable of converting an LAS file into a Type Log.
- Automatically calculates True Vertical Depth (TVD), Northing, Easting and Vertical Sections from MD, Inclination and Azimuth.
- Directional survey calculations and related minimum-curvature interpolations for geosteering and graphing.
- Graphic display of data with full zooming capabilities and coupling of graphs including LWD, Wellbore directional survey data, and Type Log.
- Segment addition and management.
- Display can be customized e.g. line colors, min/max scale limits, linear scale format etc.

- Has the capability to process files that have been dragged-and-dropped on the interface.
- Requires GeoGraphix® Discovery.

Benefits

The GVERSE WebSteering software offers you the following benefits:

- **Flexible:** Flexibility in the location where you geosteer a horizontal well from – in the office, at home, or in the field
- **Simple:** Simplified Data Entry for LWD and survey data using drag-and-drop or WITSML. Data is transferred into LMKR GeoGraphix projects via the web with one button click.
- **Integration with GeoGraphix:** Integration with GeoGraphix applications, including selection of type logs and gridded surfaces from the GeoGraphix database, and use of Web Geosteering interpretations in GeoGraphix to produce more accurate target surfaces.

System Requirements

The following sections list the system requirements for the WebSteering software.

Software

The software that must be installed on the system running the WebSteering software are as follows:

- GeoGraphix Discovery 2016.1.4 with hotfix (HF1)
- Microsoft .NET Framework 4.2 or greater
- LMKR License Management Tool 2016.1 for WebSteering license
The LMKR License Management Tool (LMT) must be installed to configure the WebSteering license.
- Adobe Reader for selected help files (optional)

Note: It is recommended that you run the WebSteering software on Internet Explorer 11.x.x and Google Chrome 61.x.x.x or later.

Operating System

To run the WebSteering software, you need the Windows® 7 or Windows® 10 operating systems installed on your system.

Note: It is recommend to use the latest Microsoft service packs and security patches.

Hardware

The hardware requirements for the WebSteering software are as follows:

- Quad 2.4 GHz 64-bit Intel® class or better
- 4 GB RAM or greater
- 1024x768 graphics resolution

Licenses

The following licenses are required to run the WebSteering software:

- GVERSE WebSteering 2016.1 license
- GeoGraphix Discovery 2016.1 license

Note: Refer to the LMKR Customer Support Portal (<http://support.lmkr.com/>) for up-to-date information on the requirements.

New Features

This section contains a brief description of the exciting new features included in the 2016.1.4 release.

Add Type Logs and Well Data to GeoGraphix

You can add type logs and well data to GeoGraphix using GVERSE WebSteering. The **Type Logs** tab of the **Dashboard** page allows you to select or drag-and-drop LAS files containing type log information. On the **Add Typelog** pop-up enter UWI, Longitude and Latitude, Elevation information, and select the desired curve as well as survey file.

Wells Surveys LWD Type Logs Surfaces

Curve Set Miles API Lease UWI Curve Log Chart Pick Target Target Formation B Payzone Top: 6145

MD	SHIFT TVD	VALUE	N/S OFFSET	EW OFFSET	RS
No matching records found					

Showing 1 to 0 of 0 rows

Well ID: Curve: Choose File

Drag and drop LAS file onto Typelog table

Add Typelog

UWI* 422730009212

Latitude* 32.48021

Longitude* 117.61957

Elevation 890

Well ID doesn't exist in GSX. A new well will be added

Select Curve SP

Add Survey Choose File 422730009212.las

OK Cancel

Adding Proposed Surveys to GeoGraphix

You can add proposed surveys to GeoGraphix using GVERSE WebSteering. The **Proposed Survey** tab of the **Surveys** tab allows you to select or drag-and-drop excel files containing survey information. On the **Map Excel Columns** pop-up, map the desired excel file columns and either select the landing point station or enter the landing point MD. A new survey ID is assigned by GeoGraphix to the proposed survey. Since the proposed survey is now saved in GeoGraphix it is populated in the **Proposed Surveys** drop-down list like all existing proposed surveys.

Map Excel Columns

MD*:

Inclination*:

Azimuth*:

Header Row*:

Data Row*:

Recalculate: TVD, NS Offset & EW Offset will be recalculated.

Landing Point Station:

Wells Surveys LWD Type Logs Surfaces

Proposed Surveys: 1503057170234_wgs

Drilling Survey Active Proposed Survey: 1503057170234_wgs VertS Azimuth: 140.65 Grid Convergence: -0.07

Proposed Survey


MD	INC	AZM	TVD	N/S OFFSET	EW OFFSET	VSD
0.00	0.00	0.00	0.00	0.00	0.00	0.00
946.00	0.51	343.16	945.99	4.03	-1.22	-3.89
986.00	0.70	356.80	985.99	4.44	-1.28	-4.25
1081.00	2.60	107.50	1080.95	4.38	0.74	-2.91
1176.00	3.90	119.30	1175.80	2.15	5.61	1.90
1271.00	3.70	120.90	1270.59	-1.01	11.06	7.80
1367.00	5.50	117.30	1366.28	-4.71	17.81	14.94
1462.00	7.30	124.60	1460.68	-10.23	26.82	24.93
1557.00	8.30	122.20	1554.80	-17.31	37.59	37.24
1652.00	10.20	124.00	1649.58	-25.87	50.37	51.81
1748.00	11.70	121.60	1742.81	-35.52	65.71	69.16
1843.00	13.60	121.50	1835.50	-46.40	83.43	88.83
1938.00	15.10	119.00	1927.54	-58.24	103.78	110.81
2033.00	14.90	118.60	2019.30	-70.09	125.33	133.71
2129.00	17.10	122.90	2111.58	-83.66	148.02	158.81
2224.00	16.90	121.40	2202.43	-98.44	171.53	184.91

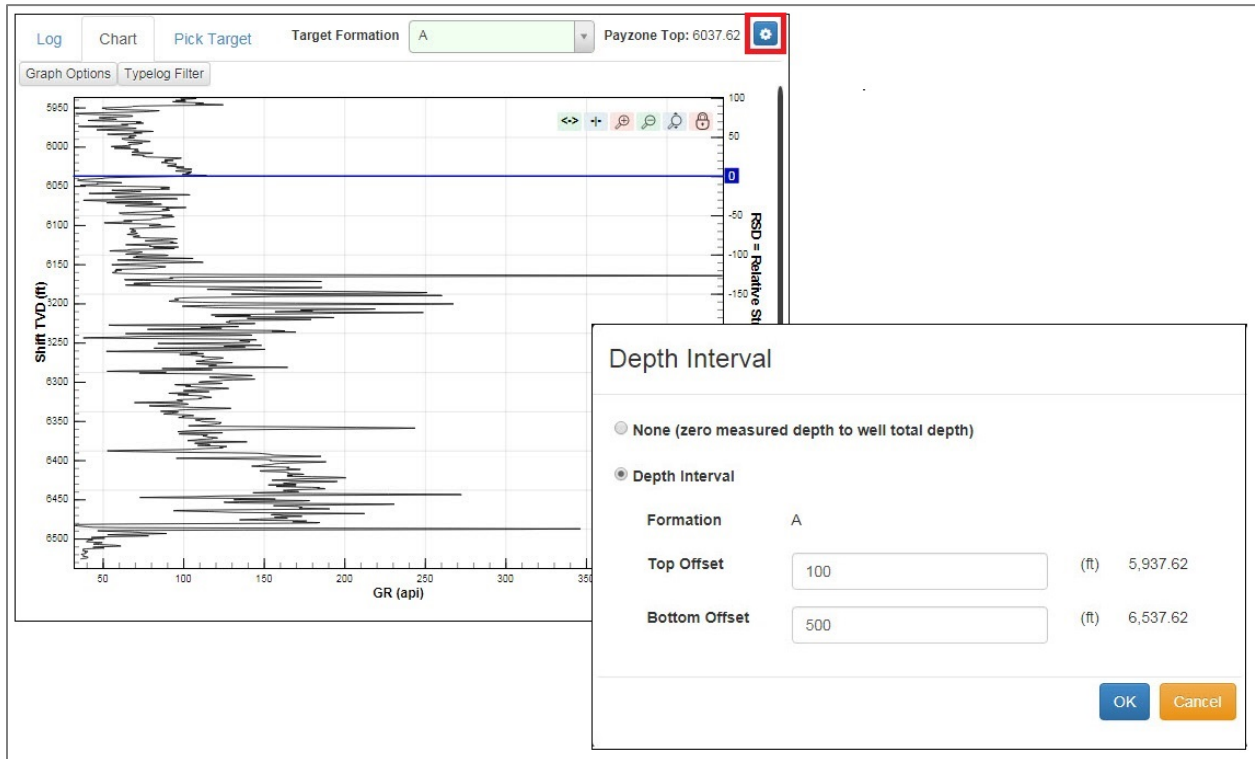
50 records per page << < 1 2 3 > >>

Well ID: 42221312470000 Survey ID: 1503057170234_wgs

Drag and drop Excel spreadsheet on Survey table

Set Depth Interval of Type Logs

You can clip the selected type log with reference to a top and bottom offset defined on the **Depth Interval** pop-up. This pop-up displays when you click the **Set Depth Interval** icon  on the **Type Logs** tab of the Dashboard. The clipped type log displays on the Chart tab of the **Type Logs** tab and the Typelog plot on the GeoSteer page.



The screenshot shows a software interface with a log plot and a 'Depth Interval' pop-up dialog. The log plot displays 'Shift TVD (ft)' on the y-axis (ranging from 5950 to 6500) and 'GR (api)' on the x-axis (ranging from 50 to 350). A blue horizontal line is drawn at approximately 6037.62 ft. The 'Depth Interval' pop-up dialog is open, showing the following settings:

- None (zero measured depth to well total depth)**:
- Depth Interval**:
- Formation**: A
- Top Offset**: 100 (ft) 5,937.62
- Bottom Offset**: 500 (ft) 6,537.62

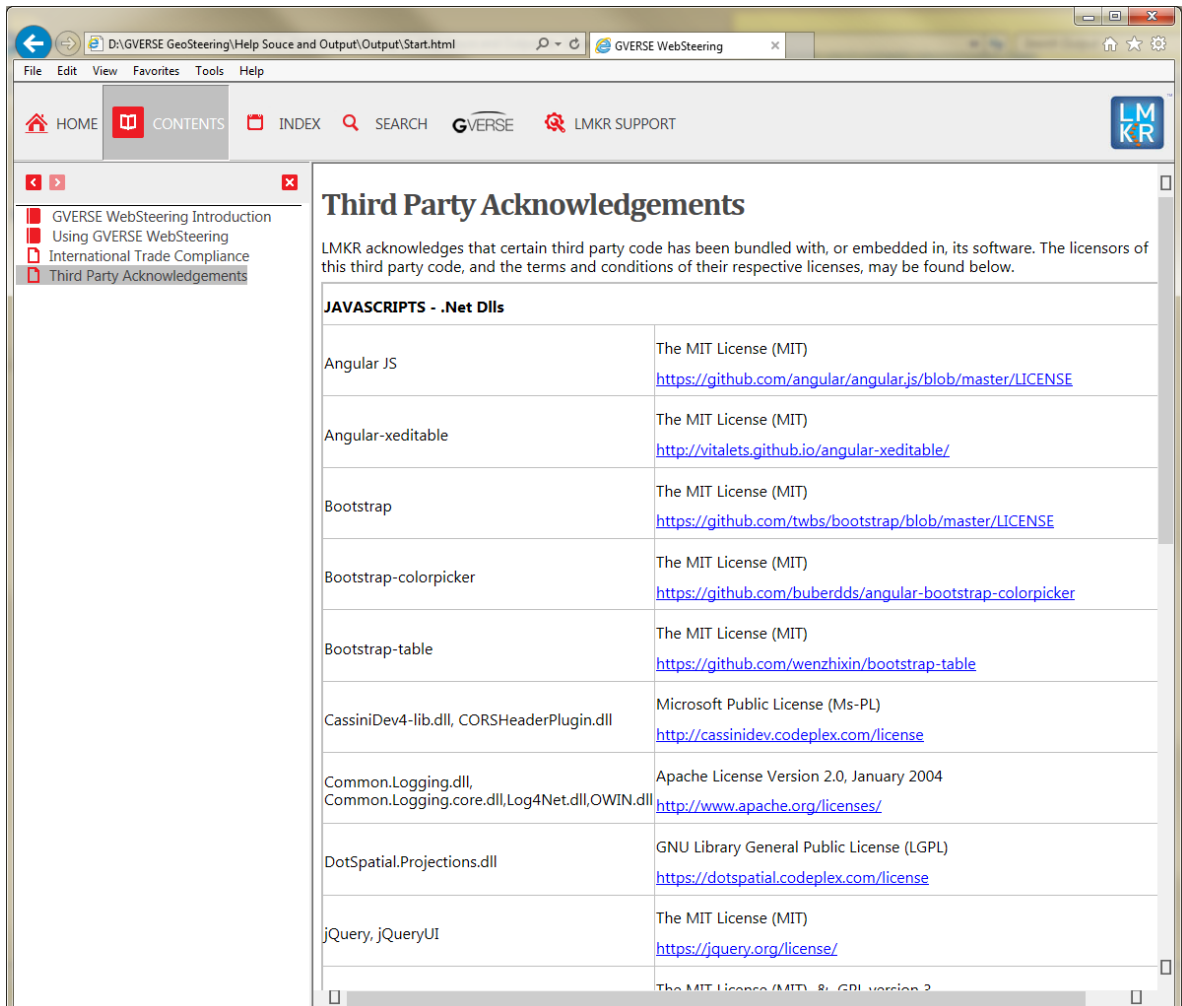
The dialog includes 'OK' and 'Cancel' buttons at the bottom right.

Third Party Applications

LMKR acknowledges that certain third party code has been bundled with, or embedded in, its software. The licensors of this third party code, and the terms and conditions of their respective licenses, may be found in the WebSteering software Help file.

To access the third party license agreements:

1. Click **Help** from the main menu bar.
2. Open the **Third Party Acknowledgements** help topic.



International Trade Compliance

This application is manufactured or designed using U.S. origin technology and is therefore subject to the export control laws of the United States. Any use or further disposition of such items is subject to U.S. law. Exports from the United States and any re-export thereafter may require a formal export license authorization from the government. If there are doubts about the requirements of the applicable law, it is recommended that the buyer obtain qualified legal advice. These items cannot be used in the design, production, use, or storage of chemical, biological, or nuclear weapons, or missiles of any kind.

The ECCNs provided (if available) here represent LMKR's opinion of the correct classification for the product today (based on the original software and/or original hardware). Classifications are subject to change. If you have any questions or need assistance please contact us at support@lmkr.com.

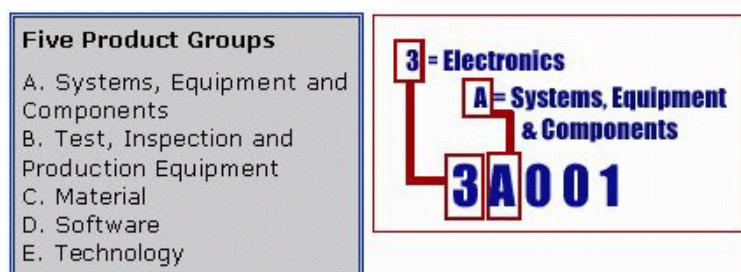
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The URL is: <http://www.bis.doc.gov>.

Definitions

ECCN - Export Control Classification Number - The ECCN is an alpha-numeric code, e.g., 3A001, that describes a particular item or type of item, and shows the controls placed on that item. The CCL (Commerce Control List) is divided into ten broad categories, and each category is further subdivided into five product groups. The CCL is available on the [EAR Website](#).

The following illustration is a sample:



The ECCN number (if available) and License Type for this product are included in the table below. Also included is the date the table was last updated.

Product/Component/R5000	EAR Number	License	Last Updated On
GVERSE WebSteering	EAR99	EAR	11/23/2015

Contacting LMKR Support

LMKR is committed to providing the highest level of technical customer support in the industry. With an average tenure of more than thirteen years, our highly trained and experienced staff of technical analysts is comprised of geoscientists, engineers, land professionals, petrophysicists, and system specialists.

Please refer to our Customer Support timings mentioned below to ensure that you have access to our support analysts assigned to your region. When getting in touch with LMKR support, please remember that real-time support will not be available during bank holidays or after office hours. If you do get in touch with LMKR Support outside of work hours, please leave a voice message with a brief description of the issue that you are facing. Your voice message will be used to automatically create a support case for you. This will enable our analysts to attend to your issue and provide you with a resolution as soon as possible

North and South America	Europe, Middle East & Africa
<p>Monday – Friday 8am-6pm CST Toll Free (US/Canada) : +1 855 GGX LMKR (449 5657) Colombia : +57 1381 4908 United States : +1 303 295 0020 Canada : +1 587 233 4004 *Excluding bank holidays</p>	<p>UK Monday - Friday 8am - 5pm +44 20 3608 8042 *Excluding bank holidays</p> <p>UAE Sunday - Thursday (Dubai GMT+4) 8am - 5pm +971 4 3727 999</p> <p>Egypt Sunday - Thursday +0800-000-0635 *Excluding bank holidays</p>
Asia Pacific & Australian Continent	Southwest Asian countries
<p>Malaysia Monday - Friday (Kuala Lumpur GMT+8) 9am - 6pm +60 32 300 8777 *Excluding bank holidays</p>	<p>Pakistan Monday - Friday (Islamabad GMT+5) 9am - 6pm +92 51 209 7400 *Excluding bank holidays</p>

Helpful Links

Name	Website Address
LMKR Homepage	http://www.lmkr.com
LMKR GVERSE	http://www.lmkr.com/gverse
LMKR Support Portal	http://support.lmkr.com