



**Release Notes**  
**MAGNET Software System**  
**Version 7.3.1**  
**July 12, 2022**

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**MAGNET V7.3.1 Release Notes - Introduction**

Please take time to read these Release Notes. They contain information about the following:

- New Features
- Improvements
- Bug fixes

**NOTE:**

It is always recommended, before upgrading your field software, users backup their original job; and following any update to your field software, users perform in-the-field checks to ensure data integrity

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# MAGNET Field V7.3.1

## General

### Magnet Field V7.3.1 Release Notes

The following new additions/revisions have been made to Magnet Field V 7.3.1

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

The Following issues have been addressed in MAGNET Field V7.3.1

- Addressed an issue with the wrong GGA sent with connection startup. When connecting to a RTK Network, MAGNET Field would send the last position from the last connection first, and then the current position.
- Addressed an issues with support of the TruPulse 200 Offset Laser. MAGNET Field would connect to the TruPulse 200X Laser but no data would stream to MAGNET Field.
- Addressed an issue in Traverse Adjustment. In MAGNET Field, when adjusting a traverse using Compass Rule, comparing the elevation error results to MAGNET Tools, the results would not match.
- Addressed an issue when importing LandXML files that contain vertical alignments. If the authoring software adds negative length elements, MAGNET Field would not import the elements correctly. MAGNET Field now correctly imports the elements as positive values.
- Addressed an issue with Site Scan data and the GTL series instrument. If the file contained Total Station measured data, the file format was incorrect and a comma between the coordinates and the code assigned to the point was missing. The points are now correctly written to the Site Scan file with the comma between the coordinates and Code.
- Addressed an issue in MAGNET Field when selecting linework on the main map. When

opening the pop-up menu from the Map, if the current position was beyond the end of the line, MAGNET Field would crash.

- Addressed an issue when exporting to the NZ Survey Report. If the report contains GNSS data, the Receiver type header section was written twice on the report.
- Addressed an issue in the NZ Survey Report. When Exporting Raw Data in NZ Survey Report ( \*.html) format - the records taken as Angle-Only were exported with incorrect Grid Azimuth and Ellipsoid Distance values.
- Addressed an issue with the layer merge feature in MAGNET Field. In previous versions, the layer merge option was removed. This option has been returned to V7.3.1.
- Addressed an issue when exporting raw data to the GTS-7 format. When exporting the raw-data to GTS-7 format the offset-values for "Horizontal Angle-Offset" and for "Distance-Offset" were correct, but the values for the "Horizontal/Vertical Angle-Offset" we not exported correctly.
- Addressed an issue in the Benchmark routine. If the job units are set to Feet/Inches, you could not enter feet and fractional inches as the elevation.
- Addressed an issue when exporting raw data in \*.xml format. When exporting raw total station data, the prism constant was not exported correctly and did not include the decimal value of the constant.
- Addressed an issue with Stake Settings on the Sokkia iX500 Total Station. The stake setting 'Search After Turn' would change to 'Search and Aim'.
- Addressed an issue when exporting a Code Library from MAGNET Field. The code symbols would not be assigned correctly in the exported Code Library.

## MAGNET Field Layout V7.3.1

### General

## Magnet Field Layout V7.3.1 Release Notes

The following new additions/revisions have been made to Magnet Field Layout V7.3.1

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

The Following issues have been addressed in MAGNET Field Layout V7.3.1

- Addressed an issue with Site Scan data and the GTL series instrument. If the file contained Total Station measured data, the file format was incorrect and a comma between the coordinates and the code assigned to the point was missing. The points are now correctly written to the Site Scan file with the comma between the coordinates and Code.
- Addressed an issue in MAGNET Field Layout when selecting linework on the main map. When opening the pop-up menu from the Map, if the current position was beyond the end of the line, MAGNET Field Layout would crash.
- Addressed an issue when exporting to the NZ Survey Report. If the report contains GNSS data, the Receiver type header section was written twice on the report.
- Addressed an issue in the NZ Survey Report. When Exporting Raw Data in NZ Survey Report ( \*.html) format - the records taken as Angle-Only were exported with incorrect Grid Azimuth and Ellipsoid Distance values.
- Addressed an issue with the layer merge feature in MAGNET Field Layout. In previous versions, the layer merge option was removed. This option has been returned to V7.3.1.
- Addressed an issue when exporting raw data to the GTS-7 format. When exporting the raw-data to GTS-7 format the offset-values for "Horizontal Angle-Offset" and for

“Distance-Offset” were correct, but the values for the “Horizontal/Vertical Angle-Offset” we not exported correctly.

- Addressed an issue in the Benchmark routine. If the job units are set to Feet/Inches, you could not enter feet and fractional inches as the elevation.
- Addressed an issue when exporting raw data in \*.xml format. When exporting raw total station data, the prism constant was not exported correctly and did not include the decimal value of the constant.
- Addressed an issue with Stake Settings on the Sokkia iX500 Total Station. The stake setting ‘Search After Turn’ would change to ‘Search and Aim’.
- Addressed an issue when exporting a Code Library from MAGNET Field Layout. The code symbols would not be assigned correctly in the exported Code Library.



## MAGNET Field V7.3

### General

## Magnet Field v7.3 Release Notes

The following new additions/revisions have been made to Magnet Field V 7.3.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### New Features and Improvements

- Added support for the new Geoid RAF20 for France.
- Improved SureTopo. A checkbox has been added to allow users the option to display the Weighted Average (WA) dialog after storing a point.
- Improved the Surface Property reported. Added 2d and 3D Surface Area to Surface Property Info screen.
- Improved import options in MAGNET Field. Added the ability to import fractional feet and inches in \*.txt and \*.csv files.
- Improved Map Display options. Users now have the option to remove both Design Point and Staked Point from the Map (Map Properties) after the point has been staked.
- Updated the live data label options. Users can now show the instant HRMS/VRMS for an epoch.
- Improved Skybridge and Starpoint support. Enabled support for the B1C signal to improve PPP solution in supported receivers.

### Resolved Issues

The Following issues have been addressed in MAGNET Field V7.3

- Addressed an issue with the Legacy HiperII GNSS receiver. The Satel Modem radio channel cannot be set up.
- Addressed an issue in the localization dialog. If a user opened the localization dialog in an old job, when closing the dialog, the 'Localization calculation method was updated' message was shown even if the user did not change/update the localization.
- Addressed an issue in Traverse Adjustment. When starting a traverse using BS > Azimuth only, the traverse would not adjust in MAGNET Field
- Addressed an issue in Coordinate Conversion. When converting coordinates to Chains, the unit conversion was not correct.
- Updated the Job History report. The report would not export as \*.txt file, only as a \*.csv file.
- Addressed an issue with the Base Distance live data label. The distance shown was incorrect when the base distance was greater than 1000m
- Addressed an issue when connected to Sitelink3D V2. In V7.1, you could not access site files stored in Sitelink V2.
- Addressed an issue with RW5 export. The Raw Data export in SurvCE (\*.RW5) format - code and string number was written to a second line and not in the same line as the observation.
- Addressed an issue with Configure Menu. Moving Configure>Instrument to the Setup menu would crash MAGNET Field.
- Fixed an issue when connecting to AIMS Dubai Leica Spider network. At times the connection was not stable, and users could not maintain a fixed solution.
- Addressed an issue with mmGps support in MAGNET Field. If a second transmitter was used, the elevation from the second transmitter was not correct.
- Addressed an issue with Network RTK support. With certain networks in Japan, the solution was not stable.
- Addressed an issue with Radio Configuration. After querying the radio channel, the status window would not update after receiving all settings and channels from

the radio.

- Addressed an issue with Localizations. If a user performed a point to point inverse and included one of the localization points, the localization would be removed from the job.

## MAGNET Field Layout V7.3

### **General**

### Magnet Field Layout v7.3 Release Notes

The following new additions/revisions have been made to Magnet Field Layout V7.3.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### New Features and Improvements

- Improved the import options in MAGNET Field Layout. Added the ability to import fractional feet and inches in \*.txt and \*.csv files.
- Improved Map Display options. Users now have the option to remove both Laid Out and Laid Out Design point(s) from the Map (Map Properties) after the point has been staked.

### **Resolved Issues**

The Following issues have been addressed in MAGNET Field Layout V7.3

- Addressed an issue with Hybrid positioning in MAGNET Field Layout. When using the internal GNSS on a FC-5000, MAGNET Field Layout would not generate a solution.
- Addressed an issue with Setup by Gridlines. The setup routine would not work if the First Point calculation method of 'Occ Pt Elevation' was selected.
- Addressed an issue in the Stake Map. The terminology displayed in the map was

incorrect, 'chainage' was displayed instead of 'Along'

- Addressed an issue in Layout> Line. If Drape Mode was enabled, the total station would rotate in the wrong direction.
- Addressed an issue in Coordinate Conversion. When converting coordinates to Chains, the unit conversion was not correct.
- Updated the Job History report. The report would not export as \*.txt file, only as a \*.csv file.
- Addressed an issue with RW5 export. The Raw Data export in SurvCE (\*.RW5) format - code and string number was written to a second line and not in the same line as the observation.
- Addressed an issue with Configure Menu. Moving Configure>Instrument to the Setup menu would crash MAGNET Field Layout.

## MAGNET Construction - V7.3

### General

## Magnet Construction v7.3 Release Notes

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- Feature Enhancements
- Issue Resolutions

### System Requirements:

Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

Processor Speed

2GHz Core2 processor or higher

RAM

2GB RAM or more recommended

Memory

Local hard drive space of 2GB or higher recommended

Computer Resolution

1280x1024 display resolution

Internet Connectivity

Can be required by some functionality.

## Magnet Construction

### Feature Enhancements:

- Global and Project Survey code dialog updated to include Magnet XML (\*.MXL) in export options.
- Import Autodesk DWG format updated to improve support for splines
- Added Trimble \*.cal format to Control Points import option

- Added Japanese Custom Format for horizontal alignment stationing
- Added optional prefix for horizontal alignment stations

## Issue Resolutions

- Corrected issue with Contour labels positioning when changing proposed scale. This applied to contour labels added using Edit Contour Label option.
- Corrected program crash in Plot Setting Library when creating a new settings profile.
- Corrected issue with points marks not being correctly retained when exporting to Autocad dwg format.

## MAGNET Layout - V7.3

### **General**

## Magnet Office Layout v7.3 Release Notes

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- Feature Enhancements
- Issue Resolutions

### System Requirements:

Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

Processor Speed

2GHz Core2 processor or higher

RAM

2GB RAM or more recommended

Memory

Local hard drive space of 2GB or higher recommended

Computer Resolution

1280x1024 display resolution

Internet Connectivity

Can be required by some functionality.

Notice:

### Magnet Office Layout EOL

Magnet Office Layout subscription and perpetual licenses are no longer available for purchase. Version 7.3 is the last scheduled update for the product.

Transition plan details for all users on Magnet Office Layout Subscription and Service plans will be announced with the Office v8 release.



## Magnet Layout

### Feature Enhancements:

- Global and Project Survey code dialog updated to include Magnet XML (\*.MXL) in export options.
- Import Autodesk DWG format updated to improve support for splines
- Added Trimble \*.cal format to Control Points import option
- Added Japanese Custom Format for horizontal alignment stationing
- Added optional prefix for horizontal alignment stations

### Issue Resolutions

- Corrected issue with Contour labels positioning when changing proposed scale. This applied to contour labels added using Edit Contour Label option.
- Corrected program crash in Plot Setting Library when creating a new settings profile.

## MAGNET Project - V7.3

### General

## Magnet Project v7.3 Release Notes

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

Processor Speed

2GHz Core2 processor or higher

RAM

2GB RAM or more recommended

Memory

Local hard drive space of 2GB or higher recommended

Computer Resolution

1280x1024 display resolution

Internet Connectivity

Can be required by some functionality.

### Project (Mass haul analysis and scheduling functionality)

This release fixes the following issues:

- Program crash when zooming in closely within the Map View.
- Program crash when deleting multiple tasks.

## Magnet Office CAD Design/Drafting, 3D Modeling functionality

### Feature Enhancements:

- Global and Project Survey code dialog updated to include Magnet XML (\*.MXL) in export options.
- Import Autodesk DWG format updated to improve support for splines
- Added Trimble \*.cal format to Control Points import option
- Added Japanese Custom Format for horizontal alignment stationing
- Added optional prefix for horizontal alignment stations

### Issue Resolutions

- Corrected issue with Contour labels positioning when changing proposed scale. This applied to contour labels added using Edit Contour Label option.
- Corrected program crash in Plot Setting Library when creating a new settings profile.
- Corrected issue with points marks not being correctly retained when exporting to Autocad dwg format.

## MAGNET Site - V7.3

### General

## Magnet Site v7.3 Release Notes

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- Feature Enhancements
- Issue Resolutions

### System Requirements:

Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

Processor Speed

2GHz Core2 processor or higher

RAM

2GB RAM or more recommended

Memory

Local hard drive space of 2GB or higher recommended

Computer Resolution

1280x1024 display resolution

Internet Connectivity

Can be required by some functionality.

## Magnet Site

### Feature Enhancements:

- Global and Project Survey code dialog updated to include Magnet XML (\*.MXL) in export options.
- Import Autodesk DWG format updated to improve support for splines
- Added Trimble \*.cal format to Control Points import option

- Added Japanese Custom Format for horizontal alignment stationing
- Added optional prefix for horizontal alignment stations

## Issue Resolutions

- Corrected issue with Contour labels positioning when changing proposed scale. This applied to contour labels added using Edit Contour Label option.
- Corrected program crash in Plot Setting Library when creating a new settings profile.
- Corrected issue with points marks not being correctly retained when exporting to Autocad dwg format.

## MAGNET Survey - V7.3

### General

## Magnet Survey v7.3 Release Notes

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- Feature Enhancements
- Issue Resolutions

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

## Magnet Survey

### Feature Enhancements:

- Global and Project Survey code dialog updated to include Magnet XML (\*.MXL) in export options.
- Import Autodesk DWG format updated to improve support for splines
- Added Trimble \*.cal format to Control Points import option
- Added Japanese Custom Format for horizontal alignment stationing

- Added optional prefix for horizontal alignment stations

## Issue Resolutions

- Corrected issue with Contour labels positioning when changing proposed scale. This applied to contour labels added using Edit Contour Label option.
- Corrected program crash in Plot Setting Library when creating a new settings profile.
- Corrected issue with points marks not being retained when exporting to Autocad dwg format.

## MAGNET Tools - V7.3

### General

## Magnet Tools/Topcon Exchange for Autodesk v7.3 Release Notes

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- Feature Enhancements
- Issue Resolutions

### System Requirements:

Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

Processor Speed

2GHz Core2 processor or higher

RAM

2GB RAM or more recommended

Memory

Local hard drive space of 2GB or higher recommended

Computer Resolution

1280x1024 display resolution

Internet Connectivity

Can be required by some functionality.

## Magnet Tools

### Feature Enhancements:

- Added Trimble \*.cal format to localization import options

### Issue Resolutions:

- NZ Survey Report
  - Added notes/image column



- Corrected issue with BS details not shown
- Corrected issue with Total Station Face Left and Face Right reporting
- Corrected issue with Total Station set up point listing ellipsoid height instead of elevation
- Corrected issue with Rover information not listed
- Corrected Total Station precision in instrument details header
- Fixed issue with Area color change not updating when modified
- Fixed issue with Area transparency modification not being applied

## Topcon Exchange for Autodesk

### Feature Enhancements

- Installation updated to include optional Topcon Exchange plug-in ribbon for use in Revit. Use of this Revit plug-in allows for export of Topcon formats supporting Magnet Field and Topcon 3DMC products. Magnet Enterprise connectivity is available by subscription .

## MAGNET 3D Exchange - V7.3

### General

## Magnet 3D Exchange v7.3 Release Notes

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- Feature Enhancements
- Issue Resolutions

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

## Magnet 3D Exchange

### Feature Enhancements:

- Global and Project Survey code dialog updated to include Magnet XML (\*.MXL) in export options.
- Import Autodesk DWG format updated to improve support for splines
- Added Trimble \*.cal format to Control Points import option
- Added Japanese Custom Format for horizontal alignment stationing

- Added optional prefix for horizontal alignment stations

## Resolutions:

- Corrected issue with points marks not being correctly retained when exporting to Autocad dwg format.

## MAGNET Field V7.2

### General

## Magnet Field V7.2 Release Notes

The following new additions/revisions have been made to Magnet Field V 7.2.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### General Functionality

#### New Features and Improvements

- Coordinate Systems:
  - Added support for the Dubai Local Transverse Mercator grid.
  - Added support for the Papa New Guinea PNG94 datum and PNGMG94 projection
  - Added support for Molodensky custom datum's in MAGNET Field
  - Added support for the Austrian datums and projections MGI M28, M31 and M34
  - Added support for Fehmarn projections and geoid.
  - Thailand Geoids added
  - Updated support for MGA94 Projection to set the default datum as GDA94
- Import/Export
  - Added support in File > Export for the MML ETRS format.
  - Improved Trimble localization support to now support \*.CAL files in addition to \*.DC

files.

- Improved MaXML raw data export to now include Pole measurements.
- Improved support for Delta Watch Monitoring software optical raw data export to now include a specific Delta Watch format 'DeltaWatchObs (\*.dat)'.  
○ Updated the NZ Survey Report to include Ellipsoidal Distances.

- Measurements

### GNSS

- Improved RTK survey setup in MAGNET Field to advance to the home screen after starting the rover radio modem.
- Improved Starting TCP/IP base – the internet connection is now started again when reconnecting to the base receiver.
- In the SkyPlot, L-band satellites have been added to the view.
- Improved PPP support to now include tectonic plates model for seeding PPP base estimation.
- Added an ability to output a “pseudo-GGA” string from MAGNET Field.
- SureTopo™: outlier detection feature for RTK surveys. SureTopo is Topcon’s patent-pending automatic method to detect and filter out random RTK positions. SureTopo™ uses automatically recorded series of RTK coordinates for a point, automatically resets both GNSS tracking and the RTK engine between records and processes these coordinates with the proprietary filtering algorithm before MAGNET Field stores the point.

### Optical

- Added an ability to shoot a distance in the Shift Scan routine
- In the Scan View, added Offset Measurement options to the ‘M’ menu.
- In the Scan View, added the toolbar for Remote control and the EDM Button.
- Supported traverse in scanning for the GTL Series. User can now perform a traverse within Site Scan and adjust the Traverse. An option ‘Replace Scan Station’ has been

added to the COGO Traverse menu which updates the station coordinates on the scanner SD card.

- Added a warning when Hybrid mode is enabled if the user selects a prism without a Hybrid offset.
- Reference line routine is expanded by measuring a point at the beginning of a line and a random point on the line to establish the direction of the Reference Line
- Setup by Gridlines added. This setup option allows a user to define two intersecting lines that define the grid lines for a project. MAGNET Field will use the calculated intersection point of the two lines to align the measured intersection lines and calculate the position of the Total Station via Resection.

## Map

- Improved support for WMS background map services to include additional map services.
- Added an option in Map Properties to hide the grid lines shown on the 3D Map.

## Stakeout

- Added an ability to create a surface from Staked Grid Points
- Improved Stake Grid, to support creating contours as Stake Surface currently does

## Miscellaneous

- Switching between front and rear cameras on the FC-6000 is now supported in MAGNET Field.

## Resolved Issues

The Following issues have been addressed in MAGNET Field V7.2

- Addressed an issue when editing rod height values in Raw Data. At times, after editing the rod height values for stored observations, the observations would not retain the edited values.

- Addressed an issue when exporting RW5 format files. The Angle and distance format was not correct and would display on top of each other.
- Addressed an issue when an imported road is selected as a Reference Centerline in Topo. MAGNET Field would crash and corrupt the job file.
- Addressed an issue with the prism constant not being applied correctly for the Backsight and Sideshot. If the Prism Constant was edited when searching in the 'Find Me Here' routine the edit was not applied.
- Addressed an issue with Photo Notes. At times, the images would show a black border at the edge of the images and not show the entire image.
- Addressed an issue in MAGNET Field when staking a line. The map would only display zoomed in very close to the line and you could not zoom/pan around the map to change the map display
- Addressed an issue when connecting a HiPer Lite receiver to MAGNET Field via BlueTooth. The receiver would not connect
- Addressed an issue when opening old jobs. When attempting to open a job file created in version 6.x in version 7.1, a 'Failed to Open Job' message would show, and the job would not open.
- Addressed an issue when outputting GGA from a Robotic Total Station. When outputting the GGA data to a COM port, the UTC time stamp (gga output) is only showing the nearest 1sec (1hz) rather than the auto topo rate set of 0.2sec (5hz). The raw data in Magnet Field would show the data is being stored at 5 times a second but not exporting correctly.
- Addressed an issue when exporting raw data to a StarNet \*.DAT file. Only the Total Station data was included in the file, not the GNSS data.

## MAGNET Field Layout V7.2

### General

## Magnet Field Layout V7.2 Release Notes

The following new additions/revisions have been made to Magnet Field Layout V 7.2.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### General Functionality

#### New Features and Improvements

- Import/Export
  - Added support in File > Export for the MML ETRS format.
  - Improved Trimble localization support to now support \*.CAL files in addition to \*.DC files.
  - Improved raw data export to MaXML format to now include Pole measurements.

- Measurements

#### Optical

- Added an ability to shoot a distance in the Shift Scan routine
- In the Scan View, added Offset Measurement options to the 'M' menu.
- In the Scan View, added the toolbar for Remote control and the EDM Button.
- Added a warning when Hybrid mode is enabled if the user selects a prism without a Hybrid offset.



- Reference line routine is expanded by measuring a point at the beginning of a line and a random point on the line to establish the direction of the Reference Line
- Setup by Gridlines added. This setup option allows a user to define two intersecting lines that define the grid lines for a project. MAGNET Field will use the calculated intersection point of the two lines to align the measured intersection lines and calculate the position of the Total Station via Resection.

## Plan

- Improved support for WMS background map services to include additional map services.
- Added an option in Plan Properties to hide the grid lines shown on the 3D Map.

## Layout

- Added an ability to create a surface from Staked Grid Points
- Improved Stake Grid, to support creating contours as Stake Surface currently does

## Miscellaneous

- Switching between front and rear cameras on the FC-6000 is now supported in MAGNET Field.

## Resolved Issues

The Following issues have been addressed in MAGNET Field V7.2

- Addressed an issue when editing rod height values in Raw Data. At times, after editing the rod height values for stored observations, the observations would not retain the edited values.
- Addressed an issue when exporting RW5 format files. The Angle and distance format was not correct and would display on top of each other.
- Addressed an issue with the prism constant not being applied correctly for the

Backsight and Sideshot. If the Prism Constant was edited when searching in the 'Find Me Here' routine the edit was not applied.

- Addressed an issue with Photo Notes. At times, the images would show a black border at the edge of the images and not show the entire image.
- Addressed an issue in MAGNET Field Layout when staking a line. The map would only display zoomed in very close to the line and you could not zoom/pan around the map to change the map display
- Addressed an issue when opening old jobs. When attempting to open a job file created in version 6.x in version 7.1, a 'Failed to Open Job' message would show, and the job would not open.
- Addressed an issue when outputting GGA from a Robotic Total Station. When outputting the GGA data to a COM port, the UTC time stamp (gga output) is only showing the nearest 1sec (1hz) rather than the auto topo rate set of 0.2sec (5hz). The raw data in Magnet Field would show the data is being stored at 5 times a second but not exporting correctly.

## MAGNET Construction - V7.2

### General

## Magnet Construction v7.2 Release Notes

The following new additions/revisions have been made to Magnet Office v7.2 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

### General Functionality

### New Features and Improvements

- "Cloud Connections" ribbon separated into two individual ribbons named Sitelink3D and Enterprise. Related functionality for Sitelink3D and Magnet Enterprise has been moved to its related ribbon.

- Design Sets is new functionality for the creation and modification of Sitelink3D v2 Design Sets. Design Sets can be transferred directly from the Design Set panel to Sitelink3D or using the Upload option located in the Sitelink ribbon.
- Cloud Data Panel is a new panel added in the Sitelink3D ribbon. This panel displays the current data residing in the Sitelink3D V2 Site data repository. A right mouse button context menu is provided for refreshing the list for individual categories on the data tree and contains additional specific options based on the object or category selected.
- Sitelink3D Client Panel updated to support Sitelink3D connected machines and filter options.
- Inquiry > Offset Distance improved to support large station values.
- Modeless Panels updated to retain their position and display settings between Magnet Office sessions. To enable this option from the Program Settings dialog toggle on the "Retain Panels for next session" option.
- Design Groups is new logic applied to computed designs created using design functions such as, corridors, trenches, road, and pads. Magnet office automatically creates these design groups internally and they can be viewed using the Design Groups icon located in the Design ribbon. Design Groups are available for export options as well as creation of Design Sets for use with Sitelink v2 and 3DMC.
- Properties Manager
  - Text edit options improved.
    - The text entry/edit field has been moved to the bottom of the Property Manager.
    - Capitalization options are now updated in the text editor when selected. Clicking in any Property Manager field or in the survey view after text edits accepts and confirms the change. Pressing the ESC key while editing the text will cancel the edits and restore the text string to its original state.
    - Point Attribute editing improved to allow attribute entry for a multiple selection of points. "Delete All" available for multiple point selection.
  - Convert options improved to include:
    - Ability to convert closed strings and polygons into a Region for use with Sitelink3D v2 and 3DMC. Conversion to Region works on individual strings and polygons.
    - Ability to convert multiple strings and polygon selections into supported objects.
      - Boundary

- Polygon
  - String
  - Pad
  - Lot
  - Polyline
  - Region
- Convert Arc improved to convert multiple selected arcs to strings. Arcs with common end points are converted into one continuous 3D Polyline in Acad.
  - Select-by Region renamed to Select-by Area.
  - Check for Updates updated to display the maintenance status for the license in use.
  - Line/Arc Tables improved to include the option to renumber the table rows based on user entered starting number.
  - Text Styles updated to support color setting of "bylayer". Applies to Insert, Text and Annotation.
  - Import/Export
    - MJF export updated to remove "As Background" option. All unnamed linework is exported automatically as a Background Image.
    - LAS import improved to include option to define the units for x,y,z coordinates.
    - XML import updated to import all vertical alignments included in the file.
    - DWG Import/Export
      - Import/Export updated to support line type thickness.
      - Export updated to improve support for custom lines types that include text.
    - IFC import updated to prompt for insertion point. By default, if insertion point is defined in the importing file, these coordinates will populate the dialog by default but may be changed if required.
    - Legacy 3DMC files updated to create individual files with the object name when multiple objects are exported. Relates to RD3, PL3, TN3.
  - Projections (added)
    - Papua New Guinea, PNG94 Datum and PNGMG94 Projection
    - UAE-DLTM projection

- Austrian Datum and projections MGI , M28, M31 and M34
- Fehmarn projection and geoid

## Bug Fixes

- Import DWG corrected to fix issue with polygon hatching not importing into its original hatch layer.
- Export DWG
  - Corrected issue with Set Annotation to Point Color and Export Annotation as Text not retaining the color setting.
  - Updated to support multiple point symbols
- Object Selection fixed to correct issue where a selected single entity remained selected after a 2<sup>nd</sup> window selection made without holding the shift key.
- Selection Window fixed issue with window selection display.
- Create Mode Lat/Long revised to prompt for first point in Lat/Long coordinates when inserting objects.
- Selection Cycling corrected to work with only data in active layers.
- Delete has been updated to reinstate warning message “Unable to delete entire selection” when the selection or part of cannot be deleted. Relates to locked layers and/or linked points.
- DTM Manager corrected issue with surface area reporting incorrect area after deleting triangles.
- Copy (Ctrl+shift) fixed refresh issue for text and symbols with color setting “bylayer”.
- Modify Ribbon, Copy and Move functions corrected to lock bearing/distance values when entered or locked.
- Resurface Design updated to correct IRI Export Profile to export only the selected string.

## MAGNET Layout - V7.2

### General

## Magnet Layout v7.2 Release Notes

The following new additions/revisions have been made to Magnet Office v7.2 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required for some functionality.

### General

#### New Features and Improvements

- Offset Distance improved to support large station values.
- Modeless Panels updated to retain their position and display settings between Magnet

Office sessions. To enable this option from the Program Settings dialog toggle on the "Retain Panels for next session" option.

- Properties Manager
  - Text edit options improved.
    - The text entry/edit field has been moved to the bottom of the Property Manager.
    - Capitalization options are now updated in the text editor when selected. Clicking in any Property Manager field or in the survey view after text edits accepts and confirms the change. Pressing the ESC key while editing the text will cancel the edits and restore the text string to its original state.
    - Point Attribute editing improved to allow attribute entry for a multiple selection of points. "Delete All" available for multiple point selection.
  - Convert options improved to include:
    - Ability to convert multiple strings and polygon selections into supported objects.
      - Polygon
      - String
      - Polyline
- Convert Arc improved to convert multiple selected arcs to strings. Arcs with common end points are converted into one continuous 3D Polyline in Acad.
- Select-by Region renamed to Select-by Area.
- Check for Updates updated to display the maintenance status for the license in use.
- Text Styles updated to support color setting of "bylayer". Applies to Insert, Text and Annotation.
- Import/Export
  - MJF export updated to remove "As Background" option. All unnamed linework is exported automatically as a Background Image.
  - LAS import improved to include option to define the units for x,y,z coordinates.
  - XML import updated to import all vertical alignments included in the file.
  - DWG Import/Export
    - Import/Export updated to support line type thickness.



- Export updated to improve support for custom lines types that include text.
- IFC import updated to prompt for insertion point. By default, if insertion point is defined in the importing file, these coordinates will populate the dialog by default but may be changed if required.
- Legacy 3DMC files updated to create individual files with the object name when multiple objects are exported. Relates to RD3, PL3, TN3.
- Projections (added)
  - Papua New Guinea, PNG94 Datum and PNGMG94 Projection
  - UAE-DLTM projection
  - Austrian Datum and projections MGI , M28, M31 and M34
  - Fehmarn projection and geoid

## Bug Fixes

- Import DWG corrected to fix issue with polygon hatching not importing into its original hatch layer.
- Export DWG
  - Corrected issue with Set Annotation to Point Color and Export Annotation as Text not retaining the color setting.
  - Updated to support multiple point symbols
- Object Selection fixed to correct issue where a selected single entity remained selected after a 2<sup>nd</sup> window selection made without holding the shift key.
- Selection Window fixed issue with window selection display.
- Create Mode Lat/Long revised to prompt for first point in Lat/Long coordinates when inserting objects.
- Selection Cycling corrected to work with only data in active layers.
- Delete has been updated to reinstate warning message “Unable to delete entire selection” when the selection or part of cannot be deleted. Relates to locked layers and/or linked points.
- Copy (Ctrl+shift) fixed refresh issue for text and symbols with color setting “bylayer”.

- Modify Ribbon, Copy and Move functions corrected to lock bearing/distance values when entered or locked.

## MAGNET Project - V7.2

### General

## Magnet Project v7.2 Release Notes

The following new additions/revisions have been made to Magnet Office v7.2 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

### Project (Mass haul analysis and scheduling functionality)

#### New Features/Improvements

- Datasets is a new category added to the Project Explorer. Charts, Reports and Mass Curves can be added to the Datasets category for user selected data for quick viewing and reference.
- Charts are a new option and is a domain object that represents a dataset of planned and actual amounts and hauls which can be visualized in the Chart View.

- Chart View is a new view where line charts can be created from planned or actual task and haul data for selected material types and locations.
- Import Actual Hauls from Sitelink3D improved workflow.
- Duplicate option added to context menu.
- Tasks
  - Added option to Add to Sum Task in the context menu.
  - Improved to export Task properties to MS Project as custom fields.
  - Added Actual Hauls tab.
- Resource Types now exported to MS Project XML format.
- Filter improvements
  - Added option to graphically select items and add to an existing filter or create new filter using the context menu.
  - Added an "Apply filter to all views" option in the Home ribbon, Filter ribbon group of each view.
  - Each view has been updated to show the name of the filter, if present, in the View name tab.
- Context Help added. Pressing F1 will open the help documentation for the active view.
- Reports
  - Improved report intervals to support "... " notation to extrapolate last interval.
  - Improved to optionally include timestamps in header and/or footer of report.

## Project (Mass haul analysis and scheduling functionality)

### Bug Fixes

- Corrected program crash when using Bing/Tile Maps. Double clicking on the tile resulted in a crash.

## CAD Design/Drafting, 3D Modeling functionality

### New Features and Improvements

- "Cloud Connections" ribbon separated into two individual ribbons named Sitelink3D

and Enterprise. Related functionality for Sitelink3D and Magnet Enterprise has been moved to its related ribbon.

- Design Sets is new functionality for the creation and modification of Sitelink3D v2 Design Sets. Design Sets can be transferred directly from the Design Set panel to Sitelink3D or using the Upload option located in the Sitelink ribbon.
- Cloud Data Panel is a new panel added in the Sitelink3D ribbon. This panel displays the current data residing in the Sitelink3D V2 Site data repository. A right mouse button context menu is provided for refreshing the list for individual categories on the data tree and contains additional specific options based on the object or category selected.
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- Inquiry > Offset Distance improved to support large station values.
- Modeless Panels updated to retain their position and display settings between Magnet Office sessions. To enable this option from the Program Settings dialog toggle on the "Retain Panels for next session" option.
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  - Text edit options improved.
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    - Ability to convert multiple strings and polygon selections into supported

objects.

- Boundary
  - Polygon
  - String
  - Pad
  - Lot
  - Polyline
  - Region
- Convert Arc improved to convert multiple selected arcs to strings. Arcs with common end points are converted into one continuous 3D Polyline in Acad.
  - Select-by Region renamed to Select-by Area.
  - Check for Updates updated to display the maintenance status for the license in use.
  - Line/Arc Tables improved to include the option to renumber the table rows based on user entered starting number.
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    - DWG Import/Export
      - Import/Export updated to support line type thickness.
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    - IFC import updated to prompt for insertion point. By default, if insertion point is defined in the importing file, these coordinates will populate the dialog by default but may be changed if required.
    - Legacy 3DMC files updated to create individual files with the object name when multiple objects are exported. Relates to RD3, PL3, TN3.
  - Coordinate Systems

- Papua New Guinea, PNG94 Datum and PNGMG94 Projection
- UAE-DLTM projection
- Austrian Datum and projections MGI , M28, M31 and M34
- Fehmarn projection and geoid

## Bug Fixes

- Import DWG corrected to fix issue with polygon hatching not importing into its original hatch layer.
- Export DWG
  - Corrected issue with Set Annotation to Point Color and Export Annotation as Text not retaining the color setting.
  - Updated to support multiple point symbols
- Object Selection fixed to correct issue where a selected single entity remained selected after a 2<sup>nd</sup> window selection made without holding the shift key.
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- Modify Ribbon, Copy and Move functions corrected to lock bearing/distance values when entered or locked.
- Resurface Design updated to correct IRI Export Profile to export only the selected string.

## Magnet Tools

### General

- Import from Internet updated to support HTTPS web sites.
- Snaps updated to include marker and flyout description.

### Coordinate Systems

- Austrian Datum and projections MGI , M28, M31 and M34 added.
- Fehmarn projection and geoid added.
- Papua New Guinea, PNG94 Datum and PNGMG94 Projection added.
- UAE-DLTM projection added.

### Bug Fixes

- Digital Level data updated to correct issue with data processing.
- Report generation updated to correct program crash when using Russian localized language file.
- Corrected issue with unreadable text after import using Russian localized language file.
- Corrected random crash when opening Point Properties dialog.

## Topcon Exchange for Autodesk Ribbon

### Improvements

- Civil 3D 2022 support



## MAGNET Site - V7.2

### General

## Magnet Site v7.2 Release Notes

The following new additions/revisions have been made to Magnet Office v7.2 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

### General Functionality

#### New Features and Improvements

- "Cloud Connections" ribbon separated into two individual ribbons named Sitelink3D and Enterprise. Related functionality for Sitelink3D and Magnet Enterprise has been moved to its related ribbon.
- Design Sets is new functionality for the creation and modification of Sitelink3D v2 Design Sets. Design Sets can be transferred directly from the Design Set panel to

Sitelink3D or using the Upload option located in the Sitelink ribbon.

- Cloud Data Panel is a new panel added in the Sitelink3D ribbon. This panel displays the current data residing in the Sitelink3D V2 Site data repository. A right mouse button context menu is provided for refreshing the list for individual categories on the data tree and contains additional specific options based on the object or category selected.
- Sitelink3D Client Panel updated to support Sitelink3D connected machines and filter options.
- Inquiry > Offset Distance improved to support large station values.
- Modeless Panels updated to retain their position and display settings between Magnet Office sessions. To enable this option from the Program Settings dialog toggle on the "Retain Panels for next session" option.
- Design Groups is new logic applied to computed designs created using design functions such as, corridors, trenches, road, and pads. Magnet office automatically creates these design groups internally and they can be viewed using the Design Groups icon located in the Design ribbon. Design Groups are available for export options as well as creation of Design Sets for use with Sitelink v2 and 3DMC.
- Properties Manager
  - Text edit options improved.
    - The text entry/edit field has been moved to the bottom of the Property Manager.
    - Capitalization options are now updated in the text editor when selected. Clicking in any Property Manager field or in the survey view after text edits accepts and confirms the change. Pressing the ESC key while editing the text will cancel the edits and restore the text string to its original state.
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  - Convert options improved to include:
    - Ability to convert closed strings and polygons into a Region for use with Sitelink3D v2 and 3DMC. Conversion to Region works on individual strings and polygons.
    - Ability to convert multiple strings and polygon selections into supported objects.
      - Boundary
      - Polygon

- String
- Pad
- Lot
- Polyline
- Region
- Convert Arc improved to convert multiple selected arcs to strings. Arcs with common end points are converted into one continuous 3D Polyline in Acad.
- Select-by Region renamed to Select-by Area.
- Check for Updates updated to display the maintenance status for the license in use.
- Line/Arc Tables improved to include the option to renumber the table rows based on user entered starting number.
- Text Styles updated to support color setting of "bylayer". Applies to Insert, Text and Annotation.
- Import/Export
  - MJF export updated to remove "As Background" option. All unnamed linework is exported automatically as a Background Image.
  - LAS import improved to include option to define the units for x,y,z coordinates.
  - XML import updated to import all vertical alignments included in the file.
  - DWG Import/Export
    - Import/Export updated to support line type thickness.
    - Export updated to improve support for custom lines types that include text.
  - IFC import updated to prompt for insertion point. By default, if insertion point is defined in the importing file, these coordinates will populate the dialog by default but may be changed if required.
  - Legacy 3DMC files updated to create individual files with the object name when multiple objects are exported. Relates to RD3, PL3, TN3.
- Projections (added)
  - Papua New Guinea, PNG94 Datum and PNGMG94 Projection
  - UAE-DLTM projection
  - Austrian Datum and projections MGI , M28, M31 and M34

- Fehmarn projection and geoid

## Bug Fixes

- Import DWG corrected to fix issue with polygon hatching not importing into its original hatch layer.
- Export DWG
  - Corrected issue with Set Annotation to Point Color and Export Annotation as Text not retaining the color setting.
  - Updated to support multiple point symbols
- Object Selection fixed to correct issue where a selected single entity remained selected after a 2<sup>nd</sup> window selection made without holding the shift key.
- Selection Window fixed issue with window selection display.
- Create Mode Lat/Long revised to prompt for first point in Lat/Long coordinates when inserting objects.
- Selection Cycling corrected to work with only data in active layers.
- Delete has been updated to reinstate warning message “Unable to delete entire selection” when the selection or part of cannot be deleted. Relates to locked layers and/or linked points.
- DTM Manager corrected issue with surface area reporting incorrect area after deleting triangles.
- Copy (Ctrl+shift) fixed refresh issue for text and symbols with color setting “bylayer”.
- Modify Ribbon, Copy and Move functions corrected to lock bearing/distance values when entered or locked.

## Magnet Tools

### General

- Import from Internet updated to support HTTPS web sites.
- Snaps updated to include marker and flyout description.

## Coordinate Systems

- Austrian Datum and projections MGI , M28, M31 and M34 added.
- Fehmarn projection and geoid added.
- Papua New Guinea, PNG94 Datum and PNGMG94 Projection added.
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## Bug Fixes

- Digital Level data updated to correct issue with data processing.
- Report generation updated to correct program crash when using Russian localized language file.
- Corrected issue with unreadable text after import using Russian localized language file.
- Corrected random crash when opening Point Properties dialog.

## Topcon Exchange for Autodesk Ribbon

### Improvements

- Civil 3D 2022 support

## MAGNET Survey - V7.2

### General

## Magnet Survey v7.2 Release Notes

The following new additions/revisions have been made to Magnet Office v7.2 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

### General Functionality

#### New Features and Improvements

- Inquiry > Offset Distance improved to support large station values.
- Modeless Panels updated to retain their position and display settings between Magnet Office sessions. To enable this option from the Program Settings dialog toggle on the

"Retain Panels for next session" option.

- Design Groups is new logic applied to computed designs created using design functions such as, corridors, trenches, road, and pads. Magnet office automatically creates these design groups internally and they can be viewed using the Design Groups icon located in the Design ribbon. Design Groups are available for export options
- Properties Manager
  - Text edit options improved.
    - The text entry/edit field has been moved to the bottom of the Property Manager.
    - Capitalization options are now updated in the text editor when selected. Clicking in any Property Manager field or in the survey view after text edits accepts and confirms the change. Pressing the ESC key while editing the text will cancel the edits and restore the text string to its original state.
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  - Convert options improved to include:
    - Ability to convert closed strings and polygons into a Region for use with Sitelink3D v2 and 3DMC. Conversion to Region works on individual strings and polygons.
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      - Polygon
      - String
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- Convert Arc improved to convert multiple selected arcs to strings. Arcs with common end points are converted into one continuous 3D Polyline in Acad.
- Select-by Region renamed to Select-by Area.
- Check for Updates updated to display the maintenance status for the license in use.
- Line/Arc Tables improved to include the option to renumber the table rows based on

user entered starting number.

- Text Styles updated to support color setting of “bylayer”. Applies to Insert, Text and Annotation.
- Import/Export
  - MJF export updated to remove “As Background” option. All unnamed linework is exported automatically as a Background Image.
  - LAS import improved to include option to define the units for x,y,z coordinates.
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    - Export updated to improve support for custom lines types that include text.
  - IFC import updated to prompt for insertion point. By default, if insertion point is defined in the importing file, these coordinates will populate the dialog by default but may be changed if required.
  - Legacy 3DMC files updated to create individual files with the object name when multiple objects are exported. Relates to RD3, PL3, TN3.
- Projections (added)
  - Papua New Guinea, PNG94 Datum and PNGMG94 Projection
  - UAE-DLTM projection
  - Austrian Datum and projections MGI , M28, M31 and M34
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## Bug Fixes

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- Export DWG
  - Corrected issue with Set Annotation to Point Color and Export Annotation as Text not retaining the color setting.
  - Updated to support multiple point symbols



- Object Selection fixed to correct issue where a selected single entity remained selected after a 2<sup>nd</sup> window selection made without holding the shift key.
- Selection Window fixed issue with window selection display.
- Create Mode Lat/Long revised to prompt for first point in Lat/Long coordinates when inserting objects.
- Selection Cycling corrected to work with only data in active layers.
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- DTM Manager corrected issue with surface area reporting incorrect area after deleting triangles.
- Copy (Ctrl+shift) fixed refresh issue for text and symbols with color setting “bylayer”.
- Modify Ribbon, Copy and Move functions corrected to lock bearing/distance values when entered or locked.

## Magnet Tools

### General

- Import from Internet updated to support HTTPS web sites.
- Snaps updated to include marker and flyout description.

### Coordinate Systems

- Austrian Datum and projections MGI , M28, M31 and M34 added.
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### Bug Fixes

- Digital Level data updated to correct issue with data processing.
- Report generation updated to correct program crash when using Russian localized language file.
- Corrected issue with unreadable text after import using Russian localized language file.

- Corrected random crash when opening Point Properties dialog.

## Topcon Exchange for Autodesk Ribbon Improvements

- Civil 3D 2022 support

## MAGNET Tools - V7.2

### General

## Magnet Tools v7.2 Release Notes

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

### General

- Import from Internet updated to support HTTPS web sites.
- Snaps updated to include marker and flyout description.

### Coordinate Systems

- Austrian Datum and projections MGI , M28, M31 and M34
- Fehmarn projection and geoid
- Papua New Guinea, PNG94 Datum and PNGMG94 Projection

- UAE-DLTM projection

#### Bug Fixes

- Digital Level data updated to correct issue with data processing.
- Report generation updated to correct program crash when using Russian localized language file.
- Corrected issue with unreadable text after import using Russian localized language file.
- Corrected random crash when opening Point Properties dialog.

#### Topcon Exchange for Autodesk Ribbon

##### Improvements

- Civil 3D 2022 support

# MAGNET Field V7.1

## General

### Magnet Field V7.1 Release Notes

The following new additions/revisions have been made to Magnet Field V 7.1.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

## General Functionality

### New Features and Improvements

- Coordinate Systems:
  - Added the Geoid Model RAF18b.
- Import/Export
  - Improved support for the 12D format. Importing linework will now come across as lines and not points.
  - Improved the GPX file format (GPS Exchange Format) XML schema to include raw data.
  - Added support for the New Zealand survey report. The report format is officially supported by the New Zealand Land Administration department.
  - Added support for the \*.GVX (GNSS Vector Exchange File Format) as an option in Raw Data export.
  - Improved Topcon Custom GNSS format in HTML to include the Coordinate System information.

- Added support in the Resection results screen to directly export the Resection Solution Report from the results screen.
- Improved export of stake reports to PDF by allowing the user to specify the file name for the export file.
- Improved the export of multiple field reports to a single PDF by allowing the user to change the order of the reports in the file.
- Improved the import of Inframodel LandXML files to support the import of supported Coordinate Systems.
- Improved \*.FBK export to include support for multi-point arcs and support for the Rectangle Control Code
- Improved IFC file support to include:
  - The import of grid lines when included in the file(s)
  - Allow users to select element types to import from IFC file(s)
- Improved the Import/Export File Open Wizard to filter files by multiple extensions. The file list for Text Files (\*.csv, \*.txt) will now show both file types.
  
- COGO
  - Improved the COGO > Inverse routine to allow users to select a line instead of Start / End Points.
  - Added support in the main map for Calculate > Line to Plane Intersection. The option 'Project to Plane' projects a line to intersect the selected plane.
  - Added support in the main map for Calculate > Point to Plane. The option 'Project to Plane' menu item has been added to the Context menu.
  - Improved Corner Angle Calculations to show both the Horizontal and Slope distances
  - Improved Enter Plan so closing a line/figure will now store the object as an Area
  - Added an option to show the stored COGO results in Edit Field Reports
  - improved the Area calculation function for Known Area - Hinge and Line to support increasing the Total Area. Previous versions only supported decreasing the total area.
  - Added the option in Planes to create a plane based on best fit from multiple points.

- Equipment
  - Added StarPoint and Skybridge support.
    - StarPoint is Topcon's stand-alone PPP subscription from Topnet Live. This service allows the user to survey using the PPP technique anywhere they can receive the corrections. Topcon offers two (2) options for receiving the PPP corrections. L-Band and NTRIP.
      - L-band is a satellite-based correction service. Corrections are transmitted in the L-Band frequency range. This method can be used anywhere in the world that the L-Band Satellites are visible
      - NTRIP is distributed via the internet. This method can be used where access to Topnet Live is available.
    - Skybridge uses PPP to maintain position accuracy when RTK is disconnected. Skybridge augments RTK when corrections to the corrections is lost. Topcon is offering 2 options for receiving the PPP corrections. L-Band and NTRIP.
      - L-Band - A satellite based correction service. Corrections are transmitted in the L-Band frequency range. This method can be used anywhere in the world that the L-Band Satellites are visible
      - NTRIP - A internet distributed correction service. This method can be used where access to Topnet Live is available
    - The GNSS receivers that support the new services are:
      - NET-G5/GNR5
      - HiPer HR
      - HiPer VR/GRX3
      - MR-2
    - Contact your local Topcon reseller for additional details.
  - In RTK Settings, updated the default GNSS correction output period to 2s to handle more satellites
  - Added support for the HydroLite DFX Echo Sounder
  - Improved Correct Base to use point naming from the Localization.
  - Optical

- Added support for 'Setup 3DMC' for the LN-150
  - Added Setup 3DMC to the MAGNET Menu in Benchmark
  - Improved Resection to display the resection residuals as Hz and Vt error not only as N,E,E
  - Improved Backsight Adjustment and added 2D transform mode as an option.
- MAP
    - Added Persistence as an option for the Toolbar snaps. Users can now use the Persistence setting to keep a selected Toolbar snap active.
    - Added 'select point from map' now allows users to select points from 3D models
    - Added new WMTS and TMS map services support
    - Added a setting to hide design points on the Map after they are staked
    - Added display of angle dimensions for selected linework. The previous version only showed length.
    - Added the display of curve dimensions (Arc Length, Delta, Radius) for selected curves
    - Updated the default 3D model selection settings: Select Multiple Points is now ON by default; and Select Insertion Points is OFF by default.
    - Improved switching between 2D and 3D Perspective views so the view orientation is retained.
  - Stakeout
    - Added High Precision Navigation mode to the Stake map. High Precision mode zooms into the point when the user navigates close to the point being staked, and then switches the navigation compass to a precise mode to assist the user when staking points. The High Precision setting is an optional setting and enabled in the Map properties menu.
    - Added Tilt as an option to Stake Reports. If a point was staked with the pole tilted, the tilt value is recorded and shown on the stake report.
    - Improved Drape Mode to add a button to recheck the surface. Users can rescan the drape surface to correct for any errors in the drape surface solution.
    - Improved Stake Curve and Stake Curve > Offsets. There is now an option to



define the curve by 3 points.

- Improved 3d Model stakeout to add an option via the right click menu to hide model elements. This option improves visibility of objects being staked
- Improved 3D Model stakeout with automatic element selection.
  
- General
  - Improved photo resolution support on the FC6000/5000 to increase the maximum resolution option to 3264 x 2448 Pixels.
  - Added support for custom date format (YYYY/MM/DD) to the Global Configuration settings.
  - Increased the maximum decimal display on Height precision to 4 digits
  - Added support in Field Reports to show Dimensions of lines.
  - Improved the calculator to support feet/inches in the edit controls
  - Improved Plane edit support to allow users the option of deleting multiple planes at once.
  - Improved Surfaces support to clip the surface triangles to the string boundary.
  - Updated and Extended Context Help.

## Resolved Issues

The following issues have been addressed in MAGNET Field 7.1

- Addressed an issue with the camera on the FC6000 Field Controller. By default, the front facing camera was on, and could not be switched to the rear facing camera.
- Addressed an issue with the HiperSR GNSS receiver and MAGNET Relay. When starting a Relay session, the HiperSR Base would connect to the Relay service but the HiperSR Rover would not connect.
- Addressed an issue with the HiperSR configured for NTRIP using the internal cell modem. The Base and Rover screens were grayed out.
- Addressed an issue when exporting AutoCAD DXF files from V7. The point numbers in the exported file were not consistent with the point numbers in the original job file.

- Addressed an issue when importing points from a text (\*.txt) file. If the imported text file had points with the same point number as points in the Job, the codes associated with the points in the text file were not imported.
- Addressed an issue when exporting a Job to a \*.dwg. if the user did not check 'Use 3D coordinates' option, lines in the job were not written to the file.
- Addressed an issue when importing a Custom Code Library. When a Custom Code Library was importing in \*.mxi format, MAGNET Field would crash.
- Addressed an issue with the output of NMEA from the Sokkia GCX3 USB port. MAGNET Field would not allow the user to configure the NMEA output to the receiver's USB Port.
- Addressed an issue when exporting a Trimble \*.DC file. The exported file would not import into Trimble software.
- Addressed an issue with exported photos. When importing the photos into some 3rd party applications, it was not possible to geo-reference the photos
- Addressed an issue when exporting a mmGPS file with Localization. The control file would contain the local coordinated but not the GNSS data.
- Addressed an issue when staking lines in IFC 3D models. After selecting the line, the Stake map view shows, but no stake values were shown.
- Addressed an issue with the Topcon GT/Sokkia iX Robotic Total Station. When setting the maximum turning speed of 128 Degrees, MAGNET Field would display 'Instrument not Responding' error message
- Addressed an issue when importing IFC files in MAGNET Field. At times, after importing the file, the original colors assigned to elements were not correctly displayed and grid lines were displayed as blocks.

# MAGNET Field Layout V7.1

## General

### Magnet Field Layout V7.1 Release Notes

The following new additions/revisions have been made to Magnet Field Layout V 7.1.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

## General Functionality

### New Features and Improvements

- Import/Export
  - Added support in the Resection results screen to directly export the Resection Report
  - Improved export of stake reports to PDF by allowing the user to specify the file name.
  - Improved the export of multiple field reports to a single PDF by allowing the user to change the order of the Field Reports combined in the file.
  - Improved \*.FBK export to include support for multi-point arcs and support for the Rectangle Control Code
  - Improved IFC file support to include:
    - The import of grid lines when included in the file(s)
    - Allow users to select element types to import from IFC file(s)
  - Improved the Import/Export File Open Wizard to filter files by multiple extensions. The file list for Text Files (\*.csv, \*.txt) will now show both file types.

- COGO

- Improved the COGO > Inverse routine to allow users to select a line instead of Start / End Points.
- Added support in the main map for Calculate > Line to Plane Intersection. The option 'Project to Plane' projects a line to intersect the selected plane.
- Added support in the main map for Calculate > Point to Plane. The option 'Project to Plane' menu item has been added to the Context menu.
- Improved Corner Angle Calculations to show both the Horizontal and Slope distances.
- Improved Enter Plan so closing a line/figure will now store the object as an Area.
- Added an option to show the stored COGO results in Edit Field Reports.
- improved the Area calculation function for Known Area - Hinge and Line to support increasing the Total Area. Previous versions only supported decreasing the total area.
- Added the option in Planes to create a plane based on best fit from multiple points.

- Equipment

- Added support for the HydroLite DFX Echo Sounder
- Optical
  - Improved Resection to display the resection residuals as Hz and Vt error not only as N,E,E
  - Improved Backsight Adjustment and added 2D Transform mode as an option.

- MAP

- Added Persistence as an option for the Toolbar snaps. Users can now use the Persistence setting to keep a selected Toolbar snap active.
- Added 'select point from map' now allows users to select points from 3D models.
- Updated WMTS and TMS map services support to include additional map services.
- Added a setting to hide design points on the Map after they are staked. This

setting will help users identify design points still to be staked.

- Added display of angle dimensions for selected linework. The previous version only showed length.
- Added the display of curve dimensions (Arc Length, Delta, Radius) for selected curves.
- Updated the default 3D model selection settings: Select Multiple Points is now ON by default; and Select Insertion Points is OFF by default.
- Improved switching between 2D and 3D Perspective views so the view orientation is retained.

- Stakeout

- Added High Precision Navigation mode to the Stake map. High Precision mode zooms into the point when the user navigates close to the point being staked, and then switches the navigation compass to a precise mode to assist the user when staking points. The High Precision setting is optional and enabled in the Map properties menu.
- Added Tilt as an option to Stake Reports. If a point was staked with the pole tilted, the tilt value is recorded and shown on the stake report.
- Improved Drape Mode to add a button to recheck the surface.
- Improved Stake Curve and Stake Curve > Offsets. There is now an option to define the curve by 3 points.
- Improved 3d Model stakeout to add an option via the right click menu to hide model elements. This option improves visibility of objects being staked.
- Improved 3D Model stakeout with automatic element selection.

- General

- Improved photo resolution support on the FC6000/5000 to increase the maximum resolution to 3264 x 2448 Pixels.
- Added support for custom date format (YYYY/MM/DD) to the Global Configuration settings
- Increased the maximum decimal display on Height precision to 4 digits
- Added support in Field Reports to show Dimensions of lines.

- Improved the calculator to support feet/inches in the edit controls
- Improved Plane edit support to allow users the option of deleting multiple planes at once.
- Improved Surfaces support to clip the surface to the string boundary.
- Extended Context Help

## Resolved Issues

The following issues have been addressed in MAGNET Field Layout 7.1

- Addressed an issue with the camera on the FC6000 Field Controller. By default, the front facing camera was on, and could not be switched to the rear facing camera.
- Addressed an issue when exporting AutoCAD DXF files from V7. The point numbers in the exported file were not consistent with the point numbers in the original job file.
- Addressed an issue when importing points from a text (\*.txt) file. If the imported text file had points with the same point number as points in the Job, the codes associated with the points in the text file were not imported.
- Addressed an issue when exporting a Job to a \*.dwg. If the user did not check 'Use 3D coordinates' option, lines in the job were not written to the file.
- Addressed an issue when importing a Custom Code Library. When a Custom Code Library was importing in \*.mxi format, MAGNET Field would crash.
- Addressed an issue with exported photos. When importing the photos into some 3rd party applications, it was not possible to geo-reference the photos
- Addressed an issue when staking lines in IFC 3D models. After selecting the line, the Stake map view shows, but no stake values were shown.
- Addressed an issue with the Topcon GT/Sokkia iX Robotic Total Station. When setting the maximum turning speed of 128 Degrees, MAGNET Field would display 'Instrument not Responding' error message
- Addressed an issue when importing IFC files in MAGNET Field. At times, after importing the file, the original colors assigned to elements were not correctly displayed and grid lines were displayed as blocks.



## MAGNET Layout - V7.1

### General

## Magnet Office Layout v7.1 Release Notes

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Resolved Issues

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

### General Functionality

#### New Features and Improvements

- Edit, Select by Region updated to prompt for objects to select if no selection is made. Previously the command must be restarted if no object specification was made after region defined.
- Multiple Area updated with new option "Exclude Internal Area", which excludes



object areas that are located within a selected external area. The total area reported is the external area selected minus the internal areas selected.

- Point Marks updated to include new Magnet Field point marks.
- Object Snaps
  - Added new optional text flyout indicator for snaps. On/Off setting located in Program Settings, Preferences tab.
  - Added new hover time setting for snap indicator display in the Program Settings, Preferences tab.
  - Improved Endpoint snap to recognize closes end point anywhere along the line.
- Import/Export
  - IFC added to import options
    - IFC models will automatically open the 3D View for display purposes
    - Supports optional base point, (x,y,z) definition and rotation setting on import
    - Supports repositioning of base point and rotation adjustment after import
    - Delete Model added
    - Tree control added for display of BIM elements
      - Arrange elements by hierarchy, groups, layers
      - Available information listed for selected element
      - Display controls, isolate and restore options
    - Outline of IFC model displayed in survey view for reference.
    - Added support for creating points from BIM elements within the IFC model.
    - IFC controls and options located in Surface ribbon 3D Model ribbon group.
  - Import Text/ASCII
    - Revised Import Text Ascii file UI to support new grid display of importing file.
    - Added new custom text file definition UI allowing for the specification of the importing data order with option to save, load and edit custom text file definitions.
    - Multiple notes are now supported in the data order definition allowing for importing various point data/information. The Notes (Ns) format field can be included in the data definition multiple times .

- A new "Ignore (I)" format field has been added for ignoring specific data within the text file. The Ignore option can be used multiple times in a custom text format.
- Improved import speed for all format orders.
- Properties Manager
  - Annotation Settings now opens the combined annotation settings dialog. This provides quick access to all annotation settings making annotation style edit quicker.
  - Conversion has been revised to support the conversion of multiple polygons to strings and vice-versa.
  - Point Notes field has been updated to remove the OK/Cancel buttons. To confirm entry or edits and exit the point note field click outside of the field. To cancel use the ESC key.
  - Elevation adjustment option has been reinstated.
  - Updated to hold tree collapse/expand state for entity type, group selection and current properties. Closing the panel will reset the UI to default settings.
- Object limit 3D View is a new setting in Program Preferences. When the number of points exceeds this setting they will appear in the 3D View as dots. If less than this limit they will be shown as regular points containing point marks, symbols, annotation etc.
- 3D View
  - Improved performance for display of large point data sets.
  - Reinstated support for color fill shading for elevation and slope zones.

## Resolved Issues

- Survey Codes, Command Codes (CR and CE) fixed to retain comments during reduction.
- Add Point, Offset Distance from Arc revised to be consistent with Offset Point from Line. The end point nearest the selection point is used as starting point for offsets.
- Inquiry, Offset Distance revised to correct issue with offset distance reported along arcs.
- Drawing Editor fixed to obey \$\$Default layer on/off flag when drawing created. Issue

with Zoom and changing contour settings fixed.

- Insert Perpendicular Line revised to fix issue with lines not being perpendicular when creating perpendicular line very close to the end points of the reference line. Routine was snapping to end points of reference line.
- Export PDF fixed to export DTM as solid color when exporting as 3D pdf.
- Property Manager revised to allow entity specific text fields to be selectable and available for copy for copy/paste. Example text include East/North/Brg/Dist fields.
- Edit, Select By revised to reinstate ability to select data types from within current selection.
- Selection Cycle updated to be disconnected from the Data Inspector and display specific data information.
- Selection Cycle updated to be disconnected from the Data Inspector and display specific data information.
- Export to Autocad \*.dwg revised to correct symbol scale issue related to non-scalable symbols.

# MAGNET Construction - V7.1

## General

## Magnet Construction v7.1 Release Notes

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

### General Functionality

- Edit, Select by Region updated to prompt for objects to select if no selection is made. Previously the command must be restarted if no object specification was made after region defined.
- Multiple Area updated with new option "Exclude Internal Area", which excludes object areas that are located within a selected external area. The total area reported is

the external area selected minus the internal areas selected.

- Point Marks updated to include new Magnet Field point marks.
- Object Snaps
  - Added new optional text flyout indicator for snaps. On/Off setting located in Program Settings, Preferences tab.
  - Added new hover time setting for snap indicator display in the Program Settings, Preferences tab.
  - Improved Endpoint snap to recognize closes end point anywhere along the line.
- Import/Export
  - IFC added to import options
    - IFC models will automatically open the 3D View for display purposes
    - Supports optional base point, (x,y,z) definition and rotation setting on import
    - Supports repositioning of base point and rotation adjustment after import
    - Delete Model added
    - Tree control added for display of BIM elements
      - Arrange elements by hierarchy, groups, layers
      - Available information listed for selected element
      - Display controls, isolate and restore options
    - Outline of IFC model displayed in survey view for reference.
    - Added support for creating points from BIM elements within the IFC model.
    - IFC controls and options located in Surface ribbon 3D Model ribbon group.
  - Import Text/ASCII
    - Revised Import Text Ascii file UI to support new grid display of importing file.
    - Added new custom text file definition UI allowing for the specification of the importing data order with option to save, load and edit custom text file definitions.
    - Multiple notes are now supported in the data order definition allowing for importing various point data/information. The Notes (Ns) format field can be included in the data definition multiple times .
    - A new "Ignore (I)" format field has been added for ignoring specific data

within the text file. The Ignore option can be used multiple times in a custom text format.

- Improved import speed for all format orders.
- Properties Manager
  - Annotation Settings now opens the combined annotation settings dialog. This provides quick access to all annotation settings making annotation style edit quicker.
  - Conversion has been revised to support the conversion of multiple polygons to strings and vice-versa.
  - Point Notes field has been updated to remove the OK/Cancel buttons. To confirm entry or edits and exit the point note field click outside of the field. To cancel use the ESC key.
  - Elevation adjustment option has been reinstated.
  - Updated to hold tree collapse/expand state for entity type, group selection and current properties. Closing the panel will reset the UI to default settings.
- Object limit 3D View is a new setting in Program Preferences. When the number of points exceeds this setting they will appear in the 3D View as dots. If less than this limit they will be shown as regular points containing point marks, symbols, annotation etc.
- 3D View
  - Improved performance for display of large point data sets.
  - Reinstated support for color fill shading for elevation and slope zones.

## DTM (Surface) Functionality

- DTM Tools updated to include xml files using the Import/Export DTM functions.
- Trim/Delete by Boundary updated to improve performance and reduce trim time.
- Improved general performance for creating and editing all DTM types.
- Legend Bar Display toggle moved to the Surface Ribbon>DTM Settings ribbon group. When inserting a cut/fill or DTM shading Legend Bar the display toggle is automatically turned on.

## Corridor/Road View Functionality

- Corridor Cross Section View has been improved with a new UI for selection and defining surfaces for the creation of a cross section set.
- Corridor Subgrades have been updated to support negative tie slopes.

## Resurface Functionality

- Resurface Design, Transfer to Survey, has been updated to include option to transfer mill/fill plan view shading and corresponding labels to the Survey view. This allows for plotting from the Survey view using Create Plot Window or Multi Sheet Plot Windows for horizontal alignments.
- Cross Slope Command History is a new option in the Resurface Design view. When open, this option records design data associated with the commands in the Cross-Slope ribbon group. The UI is modeless and support docking and auto hide options.
- Create Resurface design has been updated to support the use of existing horizontal alignments contained in the project for stationing of the design. During the create resurface design workflow, on the Alignment Dialog use the "Stationing From" dropdown list and select the alignment to be used.

## Resolved Issues

### General

- Survey Codes, Command Codes (CR and CE) fixed to retain comments during reduction.
- Add Point, Offset Distance from Arc revised to be consistent with Offset Point from Line. The end point nearest the selection point is used as starting point for offsets.
- Inquiry, Offset Distance revised to correct issue with offset distance reported along arcs.
- Lot Creation revised to no longer move points to Lot layer.
- Inquiry, Duplicate Points
  - Fixed issue with not all duplicate points being reported.
  - Fixed issue with average coordinates being set to 0,0,0.
- Drawing Editor fixed to obey \$\$Default layer on/off flag when drawing created. Issue with Zoom and changing contour settings fixed.

- Insert Perpendicular Line revised to fix issue with lines not being perpendicular when creating perpendicular line very close to the end points of the reference line. Routine was snapping to end points of reference line.
- Export PDF fixed to export DTM as solid color when exporting as 3D pdf.
- Property Manager revised to allow entity specific text fields to be selectable and available for copy for copy/paste. Example text include East/North/Brg/Dist fields.
- Edit, Select By revised to reinstate ability to select data types from within current selection.
- File, Print updated to correct issue with Background images not printing when saving as job from the drawing editor.
- Selection Cycle updated to be disconnected from the Data Inspector and display specific data information.
- Insert \*.tif file as Background Image fixed to support geo-referenced tif data.
- Translate/Rotate updated to correct issue of not all selected data being translated. Related to multiple point linkage to linework.
- Export to Autocad \*.dwg revised to correct symbol scale issue related to non-scalable symbols.

#### DTM related

- Boundary List updated to correct issue with the first created list not being saved.
- DTM Tools, Import \*.ttm file revised to fix issue with importing surface not located in correct position.

#### Corridor/Roads/Takeoff/Resurface

- Road View, Cross Section Window revised to correct issue with the orientation of the slope values in areas of super elevation.
- Road View, Update Survey View updated to correct issue with Adjusted Side Slope elevations and offsets.
- Takeoff Reports have been fixed to export as formatted \*.csv, (cells, rows, columns) when opened in Excel.
- Corridor, Section Plot has been revised to correct overlapping offset labels when using



the "Grid" format.

- Resurface Design View, Profile window revised to correct Zoom all/extents issue for previous version designs when starting station not set to zero.

## Magnet Tools

### General

- Updated installation to require administrative rights for all users.
- Planes have been updated to display in the Map View and 3D View.
- Added new symbols to base symbol library.
- 3D View updated to display custom symbols.
- Layer dropdown updated to include "Set as Current" in the right mouse button context menu.
- Residual View Updates:
  - Updated to allow disabling and enabling satellites in different ranges
  - Reorganized Context menu
- Occupation View updated to disable/enable satellites in all occupation in job.
- Added new option to pre-process GNSS occupations to show additional parameters for epochs. This includes clock biases and satellite elevations.

### Coordinate Systems

- Updated localization calculation to support new height localization method.

### Import/Export

- NZ Survey Report export has been added to the GNSS/TS/DL combined group. The report is exported in html format.
- Stakeout Reports are now supported for import and export using the Magnet XML (\*.mxl) format.
- Added NOAA GVX files to the Import/Export options.
- Added support for navigating folder structure for GNSS firmware 5.4 for transfer of data.

- Added support of Beidou B1C signal for TPS and RINEX files.

## Reports

- Added Filter control to the report options. As option names are typed the selection is filtered to show only matching options (report columns).
- The Internal Report viewer has been replaced with HTML reports which can be displayed in any web browser.
- Report Templates have been updated to restore the justification setting to left justified for column data.
- GNSS Loop Closure Report has been updated to display real numbers with trailing zeros.
- Extended Adjustment Summary Report has been updated to reposition the UWE Bounds labels.

## Miscellaneous

- Program updated to use system proxy settings for all Internet connections.

## Resolved Issues

- Fixed issue in GNSS Observation tab with values being shifted when changing the order of the data columns or resetting the column order.
- Corrected issue with RINEX 3.x files missing the rnx and crx extensions in the available format list.
- Fixed issue with measurements being marked as "Blunder" in the Observation Adjustment Status column after successful Least Squares adjustment.

## Topcon Exchange for Autodesk Ribbon

### Bug Fixes

- Fixed issue with exporting data from AutoCAD creating empty file. This issue was not present in Civil 3D.

# MAGNET Project - V7.1

## General

### Magnet Project v7.1 Release Notes

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

#### System Requirements:

##### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

##### Processor Speed

2GHz Core2 processor or higher

##### RAM

2GB RAM or more recommended

##### Memory

Local hard drive space of 2GB or higher recommended

##### Computer Resolution

1280x1024 display resolution

##### Internet Connectivity

Can be required by some functionality.

#### Project (Mass haul analysis and scheduling functionality)

- Scheduling has been updated with new advanced features
  - Resource Leveling with Task Resource Priority setting has been added. Leveling typically means resolving conflicts or over allocations in the project plan by allowing the calculation of delays and updating of the tasks automatically.
  - Float attributes added to task properties

- Show Critical Path is a new option which can be highlighted in the Gantt and Time-Location Views. Critical Path refers to the set of tasks that are critical, i.e. which cannot be delayed without the task or its successors exceeding the project finish time.
- Baselines implemented. A Baseline contains a snapshot of the project schedule. Comparison of the current project schedule to the project baseline schedule can be done in the Gantt View.
- Project Timing improved with new option to calculate the project finish time based on task timings. Requires prerequisite of project start time.
- Task
  - Improved to provide more options for presentation in the Time-Location View.
  - Updated to include specific suitable haul editing. A new tab, Allowed Hauls, has been added to the Task dialog. Hauls can now be blocked or allowed to/from specific tasks.
  - Task Timing property updated to include constraint date and additional new constraint types.
  - Actuals tab has been added to the Task dialog.
  - Added new option to set maximum and minimum Haul distances
- Material Type added new option to set maximum and minimum haul distances.
- File, Saveas has been updated to include option to save as Magnet XML (\*.mxi, \*.mxi.zip)
- Manual Haul creation in the Mass Haul View has been improved to automatically show possible destination tasks based on suitability when dragging. Dragging capability is enabled once the source task for the haul is selected.
- Import Data has been updated to support renaming of data during import, i.e. Tasks names, Location names, Material types etc.
- Project Explorer has been updated to replace "Search" with "Filter". The project tree is now filtered to show only matching items.
- Print option has been updated to save the print Header and Footer settings in the project file.
- Insert, Text Box improved to support in-place entry and edit of text.
- Quick Access Toolbar is a new customizable toolbar located above the ribbon area. Allows for quick access to commonly used functions from any view.

- Time-Location View updated to include Show Task Labels toggle.
- Map View improved support for maps from map servers. Bing Maps are available for use as the background. To enable Bing Maps add a tile map and use the Bing Map preset in the Map properties dialog. When creating a new project using the default template, Bing Maps is automatically used as the background.
- Add Haul Dialog/Allowed Hauls Task Tab improved to show warnings and errors on the dialogs with each indicated by specific icons. Errors must be resolved before the haul can be added.
- Mass Curve View added new option to include only tasks with maximum usage in the Properties Tab.
- Resource View updated to include "Calendar" property and display holidays in the view.
- Haul Calculations dialog revised to move the optional task selection to the Advanced options. Advanced options displayed by selecting the "More" button.
- Haul Resources updated to make maximum distance setting optional.

## Project (Mass haul analysis and scheduling functionality)

### Resolved Issues

- Locations updated to fix issue with modification of centerline and/or polygon coordinates. Modifications were not being applied.
- Reports updated to correct issue with commas added in intervals.
- Project Properties, Decimal place setting updated to correct issue with decimal place setting not being applied in all views.
- Fixed issue with attached PDF files causing slow project updates.
- Mass Haul View, Hauls revised to correct issue with haul data being displayed as an Asterisk when two hauls combined into one arrow.
- Window Layouts updated to correct issue with layouts not being restored correctly.

## CAD Design/Drafting, 3D Modeling functionality

### General Functionality

- Edit, Select by Region updated to prompt for objects to select if no selection is made.

Previously the command must be restarted if no object specification was made after region defined.

- Multiple Area updated with new option "Exclude Internal Area" , which excludes object areas that are located within a selected external area. The total area reported is the external area selected minus the internal areas selected.
- Point Marks updated to include new Magnet Field point marks.
- Object Snaps
  - Added new optional text flyout indicator for snaps. On/Off setting located in Program Settings, Preferences tab.
  - Added new hover time setting for snap indicator display in the Program Settings, Preferences tab.
  - Improved Endpoint snap to recognize closes end point anywhere along the line.
- Import/Export
  - IFC added to import options
    - IFC models will automatically open the 3D View for display purposes
    - Supports optional base point, (x,y,z) definition and rotation setting on import
    - Supports repositioning of base point and rotation adjustment after import
    - Delete Model added
    - Tree control added for display of BIM elements
      - Arrange elements by hierarchy, groups, layers
      - Available information listed for selected element
      - Display controls, isolate and restore options
    - Outline of IFC model displayed in survey view for reference.
    - Added support for creating points from BIM elements within the IFC model.
  - Import Text/ASCII
    - Revised Import Text Ascii file UI to support new grid display of importing file.
    - Added new custom text file definition UI allowing for the specification of the importing data order with option to save, load and edit custom text file definitions.
    - Multiple notes are now supported in the data order definition allowing for

importing various point data/information. The Notes (Ns) format field can be included in the data definition multiple times .

- A new "Ignore (I)" format field has been added for ignoring specific data within the text file. The Ignore option can be used multiple times in a custom text format.
- Improved import speed for all format orders.
- Properties Manager
  - Annotation Settings now opens the combined annotation settings dialog. This provides quick access to all annotation settings making annotation style edit quicker.
  - Conversion has been revised to support the conversion of multiple polygons to strings and vice-versa.
  - Point Notes field has been updated to remove the OK/Cancel buttons. To confirm entry or edits and exit the point note field click outside of the field. To cancel use the ESC key.
  - Elevation adjustment option has been reinstated.
  - Updated to hold tree collapse/expand state for entity type, group selection and current properties. Closing the panel will reset the UI to default settings.
- Object limit 3D View is a new setting in Program Preferences. When the number of points exceeds this setting they will appear in the 3D View as dots. If less than this limit they will be shown as regular points containing point marks, symbols, annotation etc.
- 3D View
  - Improved performance for display of large point data sets.
  - Reinstated support for color fill shading for elevation and slope zones.

## DTM (Surface) Functionality

- DTM Tools updated to include xml files using the Import/Export DTM functions.
- Trim/Delete by Boundary updated to improve performance and reduce trim time.
- Improved general performance for creating and editing all DTM types.
- Legend Bar Display toggle moved to the Surface Ribbon>DTM Settings ribbon group. When inserting a cut/fill or DTM shading Legend Bar the display toggle is automatically turned on.

## Corridor/Road View Functionality

- Cross Section View has been improved with a new UI for selection and defining surfaces for the creation of a cross section set.
- Corridor Subgrades have been updated to support negative tie slopes.

## Resurface Functionality

- Resurface Design, Transfer to Survey, has been updated to include option to transfer mill/fill plan view shading and corresponding labels to the Survey view. This allows for plotting from the Survey view using Create Plot Window or Multi Sheet Plot Windows for horizontal alignments.
- Cross Slope Command History is a new option in the Resurface Design view. When open, this option records design data associated with the commands in the Cross-Slope ribbon group. The UI is modeless and support docking and auto hide options.
- Create Resurface design has been updated to support the use of existing horizontal alignments contained in the project for stationing of the design. During the create resurface design workflow, on the Alignment Dialog use the "Stationing From" dropdown list and select the alignment to be used.

## Resolved Issues

### General

- Survey Codes, Command Codes (CR and CE) fixed to retain comments during reduction.
- Add Point, Offset Distance from Arc revised to be consistent with Offset Point from Line. The end point nearest the selection point is used as starting point for offsets.
- Inquiry, Offset Distance revised to correct issue with offset distance reported along arcs.
- Lot Creation revised to no longer move points to Lot layer.
- Inquiry, Duplicate Points
  - Fixed issue with not all duplicate points being reported.
  - Fixed issue with average coordinates being set to 0,0,0.
- Drawing Editor fixed to obey \$\$Default layer on/off flag when drawing created. Issue



with Zoom and changing contour settings fixed.

- Insert Perpendicular Line revised to fix issue with lines not being perpendicular when creating perpendicular line very close to the end points of the reference line. Routine was snapping to end points of reference line.
- Export PDF fixed to export DTM as solid color when exporting as 3D pdf.
- Property Manager revised to allow entity specific text fields to be selectable and available for copy for copy/paste. Example text include East/North/Brg/Dist fields.
- Edit, Select By revised to reinstate ability to select data types from within current selection.
- File, Print updated to correct issue with Background images not printing when saving as job from the drawing editor.
- Selection Cycle updated to be disconnected from the Data Inspector and display specific data information.
- Insert \*.tif file as Background Image fixed to support geo-referenced tif data.
- Translate/Rotate updated to correct issue of not all selected data being translated. Related to multiple point linkage to linework.
- Export to Autocad \*.dwg revised to correct symbol scale issue related to non-scalable symbols.

#### DTM related

- Boundary List updated to correct issue with the first created list not being saved.
- DTM Tools, Import \*.ttm file revised to fix issue with importing surface not being located in correct position.

#### Corridor/Roads/Takeoff/Resurface

- Road View, Cross Section Window revised to correct issue with the orientation of the slope values in areas of super elevation.
- Road View, Update Survey View updated to correct issue with Adjusted Side Slope elevations and offsets.
- Takeoff Reports have been fixed to export as formatted \*.csv, (cells, rows, columns) when opened in Excel.
- Corridor, Section Plot has been revised to correct overlapping offset labels when using the "Grid" format.
- Resurface Design View, Profile window revised to correct Zoom all/extents issue for previous version designs when starting station not set to zero.
- Road Design, Add Cross-Section revised to fix issue with reference start and end

chainages/stations changing when new cross-section added.

## Magnet Tools

### General

- Updated installation to require administrative rights for all users.
- Planes have been updated to display in the Map View and 3D View.
- Added new symbols to base symbol library.
- 3D View updated to display custom symbols.
- Layer dropdown updated to include "Set as Current" in the right mouse button context menu.
- Residual View Updates:
  - Updated to allow disabling and enabling satellites in different ranges
  - Reorganized Context menu
- Occupation View updated to disable/enable satellites in all occupation in job.
- Added new option to pre-process GNSS occupations to show additional parameters for epochs. This includes clock biases and satellite elevations.

### Coordinate Systems

- Updated localization calculation to support new height localization method.

### Import/Export

- NZ Survey Report export has been added to the GNSS/TS/DL combined group. The report is exported in html format.
- Stakeout Reports are now supported for import and export using the Magnet XML (\*.xml) format.
- Added NOAA GVX files to the Import/Export options.
- Added support for navigating folder structure for GNSS firmware 5.4 for transfer of data.
- Added support of Beidou B1C signal for TPS and RINEX files.

### Reports

- Added Filter control to the report options. As option names are typed the selection is

filtered to show only matching options (report columns).

- The Internal Report viewer has been replaced with HTML reports which can be displayed in any web browser.
- Report Templates have been updated to restore the justification setting to left justified for column data.
- GNSS Loop Closure Report has been updated to display real numbers with trailing zeros.
- Extended Adjustment Summary Report has been updated to reposition the UWE Bounds labels.

## Miscellaneous

- Program updated to use system proxy settings for all Internet connections.

## Resolved Issues

- Fixed issue in GNSS Observation tab with values being shifted when changing the order of the data columns or resetting the column order.
- Corrected issue with RINEX 3.x files missing the rnx and crx extensions in the available format list.
- Fixed issue with measurements being marked as "Blunder" in the Observation Adjustment Status column after successful Least Squares adjustment.

## Topcon Exchange for Autodesk Ribbon

### Resolved Issues

- Fixed issue with exporting data from AutoCAD creating empty file. This issue was not present in Civil 3D.

## MAGNET Site - V7.1

### General

## Magnet Site v7.1 Release Notes

The following new additions/revisions have been made to Magnet Site v7.0 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

## General Functionality

### New Features and Improvements

- Edit, Select by Region updated to prompt for objects to select if no selection is made. Previously the command must be restarted if no object specification was made after region defined.

- Multiple Area updated with new option “Exclude Internal Area” , which excludes object areas that are located within a selected external area. The total area reported is the external area selected minus the internal areas selected.
- Point Marks updated to include new Magnet Field point marks.
- Object Snaps
  - Added new optional text flyout indicator for snaps. On/Off setting located in Program Settings, Preferences tab.
  - Added new hover time setting for snap indicator display in the Program Settings, Preferences tab.
  - Improved Endpoint snap to recognize closes end point anywhere along the line.
- Import/Export
  - IFC added to import options
    - IFC models will automatically open the 3D View for display purposes
    - Supports optional base point, (x,y,z) definition and rotation setting on import
    - Supports repositioning of base point and rotation adjustment after import
    - Delete Model added
    - Tree control added for display of BIM elements
      - Arrange elements by hierarchy, groups, layers
      - Available information listed for selected element
      - Display controls, isolate and restore options
    - Outline of IFC model displayed in survey view for reference.
    - Added support for creating points from BIM elements within the IFC model.
    - IFC controls and options located in Surface ribbon 3D Model ribbon group.
  - Import Text/ASCII
    - Revised Import Text Ascii file UI to support new grid display of importing file.
    - Added new custom text file definition UI allowing for the specification of the importing data order with option to save, load and edit custom text file definitions.
    - Multiple notes are now supported in the data order definition allowing for importing various point data/information. The Notes (Ns) format field can be

included in the data definition multiple times .

- A new "Ignore (I)" format field has been added for ignoring specific data within the text file. The Ignore option can be used multiple times in a custom text format.
- Improved import speed for all format orders.
- Properties Manager
  - Annotation Settings now opens the combined annotation settings dialog. This provides quick access to all annotation settings making annotation style edit quicker.
  - Conversion has been revised to support the conversion of multiple polygons to strings and vice-versa.
  - Point Notes field has been updated to remove the OK/Cancel buttons. To confirm entry or edits and exit the point note field click outside of the field. To cancel use the ESC key.
  - Elevation adjustment option has been reinstated.
  - Updated to hold tree collapse/expand state for entity type, group selection and current properties. Closing the panel will reset the UI to default settings.
- Object limit 3D View is a new setting in Program Preferences. When the number of points exceeds this setting they will appear in the 3D View as dots. If less than this limit they will be shown as regular points containing point marks, symbols, annotation etc.
- 3D View
  - Improved performance for display of large point data sets.
  - Reinstated support for color fill shading for elevation and slope zones.

## DTM (Surface) Functionality

- DTM Tools updated to include xml files using the Import/Export DTM functions.
- Trim/Delete by Boundary updated to improve performance and reduce trim time.
- Improved general performance for creating and editing all DTM types.
- Legend Bar Display toggle moved to the Surface Ribbon>DTM Settings ribbon group. When inserting a cut/fill or DTM shading Legend Bar the display toggle is automatically turned on.

## Corridor/Road View Functionality

- Corridor Cross Section View has been improved with a new UI for selection and defining surfaces for the creation of a cross section set.
- Corridor Subgrades have been updated to support negative tie slopes.

## Resolved Issues

- Survey Codes, Command Codes (CR and CE) fixed to retain comments during reduction.
- Add Point, Offset Distance from Arc revised to be consistent with Offset Point from Line. The end point nearest the selection point is used as starting point for offsets.
- Inquiry, Offset Distance revised to correct issue with offset distance reported along arcs.
- Lot Creation revised to no longer move points to Lot layer.
- Inquiry, Duplicate Points
  - Fixed issue with not all duplicate points being reported.
  - Fixed issue with average coordinates being set to 0,0,0.
- Drawing Editor fixed to obey \$\$Default layer on/off flag when drawing created. Issue with Zoom and changing contour settings fixed.
- Insert Perpendicular Line revised to fix issue with lines not being perpendicular when creating perpendicular line very close to the end points of the reference line. Routine was snapping to end points of reference line.
- Export PDF fixed to export DTM as solid color when exporting as 3D pdf.
- Property Manager revised to allow entity specific text fields to be selectable and available for copy for copy/paste. Example text include East/North/Brg/Dist fields.
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- Translate/Rotate updated to correct issue of not all selected data being translated. Related to multiple point linkage to linework.
- Export to Autocad \*.dwg revised to correct symbol scale issue related to non-scalable symbols.

## DTM related

- Boundary List updated to correct issue with the first created list not being saved.
- DTM Tools, Import \*.ttm file revised to fix issue with importing surface not located in correct position.

## Corridor/Roads/Takeoff/Resurface

- Road View, Cross Section Window revised to correct issue with the orientation of the slope values in areas of super elevation.
- Road View, Update Survey View updated to correct issue with Adjusted Side Slope elevations and offsets.
- Corridor, Section Plot has been revised to correct overlapping offset labels when using the "Grid" format.
- Road Design, Add Cross-Section revised to fix issue with reference start and end chainages/stations changing when new cross-section added.

# Magnet Tools

## General

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- Added new symbols to base symbol library.
- 3D View updated to display custom symbols.
- Layer dropdown updated to include "Set as Current" in the right mouse button context menu.
- Residual View Updates:
  - Updated to allow disabling and enabling satellites in different ranges
  - Reorganized Context menu
- Occupation View updated to disable/enable satellites in all occupation in job.
- Added new option to pre-process GNSS occupations to show additional parameters for epochs. This includes clock biases and satellite elevations.

## Coordinate Systems

- Updated localization calculation to support new height localization method.



## Import/Export

- NZ Survey Report export has been added to the GNSS/TS/DL combined group. The report is exported in html format.
- Stakeout Reports are now supported for import and export using the Magnet XML (\*.mxi) format.
- Added NOAA GVX files to the Import/Export options.
- Added support for navigating folder structure for GNSS firmware 5.4 for transfer of data.
- Added support of Beidou B1C signal for TPS and RINEX files.

## Reports

- Added Filter control to the report options. As option names are typed the selection is filtered to show only matching options (report columns).
- The Internal Report viewer has been replaced with HTML reports which can be displayed in any web browser.
- Report Templates have been updated to restore the justification setting to left justified for column data.
- GNSS Loop Closure Report has been updated to display real numbers with trailing zeros.
- Extended Adjustment Summary Report has been updated to reposition the UWE Bounds labels.

## Miscellaneous

- Program updated to use system proxy settings for all Internet connections.

## Resolved Issues

- Fixed issue in GNSS Observation tab with values being shifted when changing the order of the data columns or resetting the column order.
- Corrected issue with RINEX 3.x files missing the rnx and crx extensions in the available format list.
- Fixed issue with measurements being marked as "Blunder" in the Observation Adjustment Status column after successful Least Squares adjustment.

## Topcon Exchange for Autodesk Ribbon

### Resolved Issues

- Fixed issue with exporting data from AutoCAD creating empty file. This issue was not present in Civil 3D.

# MAGNET Survey - V7.1

## General

### Magnet Survey v7.1 Release Notes

The following new additions/revisions have been made to Magnet Survey v7.1 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

#### System Requirements:

##### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

##### Processor Speed

2GHz Core2 processor or higher

##### RAM

2GB RAM or more recommended

##### Memory

Local hard drive space of 2GB or higher recommended

##### Computer Resolution

1280x1024 display resolution

##### Internet Connectivity

Can be required by some functionality.

#### General Functionality

- Edit, Select by Region updated to prompt for objects to select if no selection is made. Previously the command must be restarted if no object specification was made after region defined.
- Multiple Area updated with new option "Exclude Internal Area", which excludes object areas that are located within a selected external area. The total area reported is the external area selected minus the internal areas selected.

- Point Marks updated to include new Magnet Field point marks.
- Object Snaps
  - Added new optional text flyout indicator for snaps. On/Off setting located in Program Settings, Preferences tab.
  - Added new hover time setting for snap indicator display in the Program Settings, Preferences tab.
  - Improved Endpoint snap to recognize closes end point anywhere along the line.
- Import/Export
  - IFC added to import options
    - IFC models will automatically open the 3D View for display purposes
    - Supports optional base point, (x,y,z) definition and rotation setting on import
    - Supports repositioning of base point and rotation adjustment after import
    - Delete Model added
    - Tree control added for display of BIM elements
      - Arrange elements by hierarchy, groups, layers
      - Available information listed for selected element
      - Display controls, isolate and restore options
    - Outline of IFC model displayed in survey view for reference.
    - Added support for creating points from BIM elements within the IFC model.
    - IFC controls and options located in Surface ribbon 3D Model ribbon group.
  - Import Text/ASCII
    - Revised Import Text Ascii file UI to support new grid display of importing file.
    - Added new custom text file definition UI allowing for the specification of the importing data order with option to save, load and edit custom text file definitions.
    - Multiple notes are now supported in the data order definition allowing for importing various point data/information. The Notes (Ns) format field can be included in the data definition multiple times .
    - A new "Ignore (I)" format field has been added for ignoring specific data within the text file. The Ignore option can be used multiple times in a

custom text format.

- Improved import speed for all format orders.
- Properties Manager
  - Annotation Settings now opens the combined annotation settings dialog. This provides quick access to all annotation settings making annotation style edit quicker.
  - Conversion has been revised to support the conversion of multiple polygons to strings and vice-versa.
  - Point Notes field has been updated to remove the OK/Cancel buttons. To confirm entry or edits and exit the point note field click outside of the field. To cancel use the ESC key.
  - Elevation adjustment option has been reinstated.
  - Updated to hold tree collapse/expand state for entity type, group selection and current properties. Closing the panel will reset the UI to default settings.
- Object limit 3D View is a new setting in Program Preferences. When the number of points exceeds this setting they will appear in the 3D View as dots. If less than this limit they will be shown as regular points containing point marks, symbols, annotation etc.
- 3D View
  - Improved performance for display of large point data sets.
  - Reinstated support for color fill shading for elevation and slope zones.

## DTM (Surface) Functionality

- DTM Tools updated to include xml files using the Import/Export DTM functions.
- Trim/Delete by Boundary updated to improve performance and reduce trim time.
- Improved general performance for creating and editing all DTM types.
- Legend Bar Display toggle moved to the Surface Ribbon>DTM Settings ribbon group. When inserting a cut/fill or DTM shading Legend Bar the display toggle is automatically turned on.

## Resolved Issues

### General

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  - Fixed issue with not all duplicate points being reported.
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- Drawing Editor fixed to obey \$\$Default layer on/off flag when drawing created. Issue with Zoom and changing contour settings fixed.
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- Insert \*.tif file as Background Image fixed to support geo-referenced tif data.
- Translate/Rotate updated to correct issue of not all selected data being translated. Related to multiple point linkage to linework.
- Export to Autocad \*.dwg revised to correct symbol scale issue related to non-scalable symbols.

## DTM related

- Boundary List updated to correct issue with the first created list not being saved.
- DTM Tools, Import \*.ttm file revised to fix issue with importing surface not located in correct position.

## Corridor/Roads/Takeoff/Resurface

- Road View, Update Survey View updated to correct issue with Adjusted Side Slope elevations and offsets.

# Magnet Tools

## New Features and Improvements

### General

- Updated installation to require administrative rights for all users.
- Planes have been updated to display in the Map View and 3D View.
- Added new symbols to base symbol library.
- 3D View updated to display custom symbols.
- Layer dropdown updated to include "Set as Current" in the right mouse button context menu.
- Residual View Updates:
  - Updated to allow disabling and enabling satellites in different ranges
  - Reorganized Context menu
- Occupation View updated to disable/enable satellites in all occupation in job.
- Added new option to pre-process GNSS occupations to show additional parameters for epochs. This includes clock biases and satellite elevations.

## Coordinate Systems

- Updated localization calculation to support new height localization method.

## Import/Export

- NZ Survey Report export has been added to the GNSS/TS/DL combined group. The report is exported in html format.
- Stakeout Reports are now supported for import and export using the Magnet XML (\*.mxi) format.
- Added NOAA GVX files to Import/Export options.
- Added support for navigating folder structure for GNSS firmware 5.4 for transfer of data.
- Added support of Beidou B1C signal for TPS and RINEX files.

## Reports

- Added Filter control to the report options. As option names are typed the selection is filtered to show only matching options (report columns).
- The Internal Report viewer has been replaced with HTML reports which can be displayed in any web browser.
- Report Templates have been updated to restore the justification setting to left justified for column data.
- GNSS Loop Closure Report has been updated to display real numbers with trailing zeros.
- Extended Adjustment Summary Report has been updated to reposition the UWE Bounds labels.

## Miscellaneous

- Program updated to use system proxy settings for all Internet connections.

## Resolved Issues

- Fixed issue in GNSS Observation tab with values being shifted when changing the order of the data columns or resetting the column order.
- Corrected issue with RINEX 3.x files missing the rnx and crx extensions in the available format list.
- Fixed issue with measurements being marked as "Blunder" in the Observation Adjustment Status column after successful Least Squares adjustment.



## Topcon Exchange for Autodesk Ribbon

### Resolved Issues

- Fixed issue with exporting data from AutoCAD creating empty file. This issue was not present in Civil 3D.

## MAGNET 3D Exchange - V7.1

### General

## Magnet 3D Exchange v7.1 Release Notes

The following new additions/revisions have been made to Magnet Office v7.1 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

### General Functionality

- Added support for GD3 files. Location – Surface ribbon, options include:
  - Create
  - Import

- Export as GD3 or ASCII text file (\*.txt)
- Display
- Delete
- Grid Manager
  
- Edit, Select by Region updated to prompt for objects to select if no selection is made. Previously the command must be restarted if no object specification was made after region defined.
- Point Marks updated to include new Magnet Field point marks.
- Object Snaps
  - Added new optional text flyout indicator for snaps. On/Off setting located in Program Settings, Preferences tab.
  - Added new hover time setting for snap indicator display in the Program Settings, Preferences tab.
  - Improved Endpoint snap to recognize closes end point anywhere along the line.
  - Import Text/ASCII
    - Revised Import Text Ascii file UI to support new grid display of importing file.
    - Added new custom text file definition UI allowing for the specification of the importing data order with option to save, load and edit custom text file definitions.
    - Multiple notes are now supported in the data order definition allowing for importing various point data/information. The Notes (Ns) format field can be included in the data definition multiple times.
    - A new "Ignore (I)" format field has been added for ignoring specific data within the text file. The Ignore option can be used multiple times in a custom text format.
    - Improved import speed for all format orders.
- Properties Manager
  - Annotation Settings now opens the combined annotation settings dialog. This provides quick access to all annotation settings making annotation style edit quicker.
  - Conversion has been revised to support the conversion of multiple polygons to

strings and vice-versa.

- Point Notes field has been updated to remove the OK/Cancel buttons. To confirm entry or edits and exit the point note field click outside of the field. To cancel use the ESC key.
- Elevation adjustment option has been reinstated.
- Updated to hold tree collapse/expand state for entity type, group selection and current properties. Closing the panel will reset the UI to default settings.
- Object limit 3D View is a new setting in Program Preferences. When the number of points exceeds this setting they will appear in the 3D View as dots. If less than this limit they will be shown as regular points containing point marks, symbols, annotation etc.
- 3D View
  - Improved performance for display of large point data sets.
  - Reinstated support for color fill shading for elevation and slope zones.

## DTM (Surface) Functionality

- DTM Tools updated to include xml files using the Import/Export DTM functions.
- Trim/Delete by Boundary updated to improve performance and reduce trim time.
- Improved general performance for creating and editing all DTM types.

## Resolved Issues

### General

- Survey Codes, Command Codes (CR and CE) fixed to retain comments during reduction.
- Add Point, Offset Distance from Arc revised to be consistent with Offset Point from Line. The end point nearest the selection point is used as starting point for offsets.
- Export PDF fixed to export DTM as solid color when exporting as 3D pdf.
- Property Manager revised to allow entity specific text fields to be selectable and available for copy for copy/paste. Example text include East/North/Brg/Dist fields.
- Edit, Select By revised to reinstate ability to select data types from within current selection.
- Selection Cycle updated to be disconnected from the Data Inspector and display

specific data information.

- Export to Autocad \*.dwg revised to correct symbol scale issue related to non-scalable symbols.
- DTM Tools, Import \*.ttm file revised to fix issue with importing surface not located in correct position.

## MAGNET Field - V7.0

### General

## Magnet Field V7 Release Notes

The following new additions/revisions have been made to Magnet Field V 7.0.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

## General Functionality

### New Features and Improvements

- Reporting:
  - Added headers to stake reports and users can now add company logos to Reports. The 'Report Header' feature is available under 'Reports' and allows you to select a logo for your Field and Stake Reports.
  - Added support in COGO calculations to save COGO calculations to Field Reports and export as a PDF. Users can now combine all field reports to a single file for export.
  - Headers have been added to stake reports and include: Job Name, Date, Time, Surveyor/user
  - Units are now added to Stake reports
  - Improved Field Reports to allow multiple images to be attached to a report.
  - Added the option to export multiple stake report types to a single PDF
  - Improved Stake reports and optimized the column width in Stake Reports when exporting to PDF.

- Planes: added the ability to create planes in MAGNET Field. Planes can be defined by the following methods:
  - Horizontal
  - Vertical
  - Sloping
  - 3-Points

Horizontal, Vertical and sloping planes are defined by a point and direction. The bounds of the plane is defined by the distance from the point in the X and Y direction.

Sloping planes allow you to define the crossfall and mainfall slope of the plane.

Defining planes by three points allow you to pick any three points in the job to define the direction and slope of the plane. You can also set the dimensions of the plane based on the distance X and Y from the center of the plane.

Users can also define the properties of a Plane (Layer, Style, Color) as well as fill type and line styles for the plane.

- Custom Symbols
  - Custom symbols allow the use of CAD 'type' symbols in MAGNET Field and include:
    - 2D and 3D User Defined Symbol support
    - Edit and manage custom symbols
    - Import custom symbols from Office
    - Draw custom symbols on the 2D and 3D map
    - Updated list of standard symbols to include many additional symbol types that are available in AutoCAD
    - Updated the Modify Layer tab in Edit Point to allow users to modify Codes and support symbol selection in the Point symbols dialog
    - Update the Modify Add/Edit code dialog to support custom symbols
    - Added the Custom Symbols menu item to Main Menu>Configure>Codes>M
    - Added a new option to edit the Symbol Properties (name, scale, rotation, description)

- Added support for common Electrical symbols.
- Import/Export
  - Added Export to SurPac string format (\*.str)
  - Added Import/Export of KMZ and Export of KML files.
  - Improved support for TP3/RD3 format files and now support end stations for X-Sections.
  - Improved the export to MML ETRS format and now include the projection information in the export file.
  - Improved support for HeXML files and not support the import/export of attributes for lines.
  - Improved LandXML import when point codes are in the LandXML file. When importing a file and the points in the X-Sections have codes (names) the Codes are now imported and the name is used for the X-Section.
  - DWG format
    - Support roads import from Civil3D DWG 2018/2019/2020
    - Export improved to support export of point elevations with Use in Surface ON. Elevations of point with Use in Surface off are exported with elevation 0.
  - Added \*.csv as an option to:
    - Topcon Text Custom
    - Topcon Text Custom QA
    - Topcon Text Report
  - Updated Topcon Text Custom Fixed to allow specifying the Field length and alignment of columns
  - Updated SHP export to include QA data with each point, generated as attributes for the point. The export now includes: Date & Time, #SV, GNSS Solution Type, RMS, PDOP. Improved SHP file export to include X,Y,Z (position information) as attributes to the Shapefile. Raw data output (SDR and RW5 formats) now includes the measurement type (Prism/Reflectorless/Sheet)
  - Added the prism constant to export Raw Data/LandXML output format.



- Updated the export of \*.DGN files. Added Point Number and Code to the DGN format export option. Previously only X,Y,Z was exported for points.
- Improved the Job History Txt report. When configured for Hybrid and the job includes GNSS data, the points measured with GNSS are now included in the txt file.
- MaXML 1.5 Import/Export new data types:
  - Custom symbols
  - Background Images
  - Network RTK information
  - Full Optical Prism information
  - Multiple photos attached to a Field Report
- Added support for Import/Export of Custom Symbols between Jobs
- Added support for Import/Export of Custom Planes between Jobs
- Improved \*.txt formats and now allow users to order the export file by Point Name.
- Added the option to directly import linework to a job. Previously, linework was only imported as a background vector image.
- Improved raw data export to include instrument details (instrument name, serial number and ROM version) to the raw data formats that support the additional data.
  
- Enter Plan
  - Added the ability to display lengths in Enter Plan
  - Added the option the add/edit the name of points as they are calculated
  - Added the option to extend the length of an existing line.
  - Added the option 'Store+' for linework. This option allows the user to continue the current command.
  - Added a 'direction' arrow showing the user the direction the next element is going.
  
  - Added the option to create an arc with two points and a radius.

- COGO

- Added the Map page to COGO results. Users can now view their COGO calculations on the map in the following Inverse routines:
  - Point in Direction, Curve Calculations, Traverse, Corner Angle, 3D Corner Angle Offsets, Spiral Solution, Vertical Angle and, Triangle Calculations
  - Calculation results can be exported to a Field Report directly from the Calculate Results Map tab.
- Added 'Backsight Adjustment' to the Setup menu group. Allows users to transform all points in a job. This option now allows you to select:
  - 2D Transform, Rotate or Translate as options to modify Total Station job data.
- Added COGO calculations for:
  - Line to Plane
  - Point to Plane
- Improved Transform by Plotting Scale to automatically use 0,0,0 for the origin point if an origin point is not specified.
- Improved the Rectangle control code to include support for vertical shapes.

- Languages

- Added support for Hungarian

- Map

- Added the option to Lock Layers in background drawings. Users can lock the layer of the background drawing so the linework remains visible but is not selectable.
- Added the option in Map Properties to show line dimensions. Dimensions will show when linework is selected.
- Improved the Fillet linework snap command to create a single arc. Previous versions created two separate arcs.
- Improved the linework snap toolbar action to allow users to edit the point created from the map context menu

- Improved support of WMS in MAGNET Field. Additional mapping services have been added to the support service list.
  - Improved switching from 2D to 3D mode so zoom levels are now retained.
  - Improved the X-Section view to allow users to pan in the view.
  - Improved the String set view in String Set and Edit String Set to label the strings in the map preview.
  - Improved the overhead view to show the Total Station and the BS Prism location as well as the orientation between the setup and the design point.
  - Added the option to Edit the Prism Height in the resection results screen and automatically recompute the resection. This improvement eliminates the need to re-observe the resection points.
  - Added the option in Edit Points to set any observed point as a Control Point.
  - Improved surface support by supporting selecting linework to create the boundary. In previous versions, the user could only select points to create the boundary.
  - Added the option to view the design surface contours. Added the ability to show contour lines with the defined interval. The contours can be turned on/off based on the Surface toggle in Map Properties.
  - Added the option to automatically store additional attributes with points. Users can now store: HRMS, VRMS, PDOP, Solution Type, # Sats, Time/Date. When exporting at Topcon Text Custom QC the attributes are included.
  - MAGNET Field now supports an internet connection when the sim card is set to IPv6. Added 'Receiver Settings' to Setup> Manager Receiver. Users can now setup a receiver BT Pin.
  - Added the ability to Reset Satellite Tracking and Base data for RTK surveys.
  - Added support for NavIC measurement messages in the outgoing RTCM3 stream
  - Added the option to mark a point of any type as a control point.
  - Improved 3D model support to support textures from MAGNET Modeler.
  - Added the prompt for Code for COGO run from the Main Map.
- Topo
    - Added Codes and Notes Mode in Topo. There is now a second field in the

Normal view that is selectable so the user can choose between a second Code field or the Notes Field.

- Added Stop and Go mode to Auto Topo. Users can now automatically store a point based on the time they have stopped moving. For example, when surveying a road, Auto Topo can be set to auto-collect a point when a user stops for 2 seconds. Saving the user from having to select 'save' when they stop.
  - Added Auto Topo to stake Surface and Surface Topo routines.
  - Improved Auto Topo when connected to Optical instruments to automatically create hybrid localization. Hybrid localization is auto calculated when performing Auto-Topo. Hybrid search will become available after the localization is complete.
  - Improved point numbering with Topo and Setup. Point numbering for Setup Occupation points and Topo points can now be separate. For example, if the last Topo point was 200, you can name your setup point 300, 301, etc and when returning to Topo, the next point will be 201, so the sequence is now lasttopopoint+1.
  - Improved Auto Topo to automatically create Hybrid localization.
- Stake
    - Added the option in Stake Point in Direction to enter a slope value. The Grade option has been added to the dialog.
    - Improved support of CLIP files to show the extrapolated X Sections forward or back from an alignment as dashed, so the user can see they section is not part of the imported X Section set.
    - Improved Stake to allow users to stake down station. Auto advance has been updated to include the option to stake up or down station
    - Improved the point list so when selecting a point on the list, the point is now highlighted on the preview map.
    - Added the Plane(s) object option to use a plane for reference or drape mode and to store and re-determine the plane.
    - When staking from a reference surface, added the option to Hold Slope when staking slopes extended from the reference surface.
    - Added the Slope Option in Stake Point in Direction

- Improved stake out lines defined by two points to support reversing the line direction by one button click.
- Updated Staking a Road with DTM surface to replace the Stake Slope template option with Extend Surface option.
- Drape Mode
  - Added the option to set a plane for multiple points.
  - Added an option to adjust the defined surface. Users can define the surface to drape points and adjust the surface from the MAP screen. This helps if the surface is out of level for example, the user can re-run the routine to tighten up the surface you are projecting points.
  - Added the option to drape a pipe to a wall.
- Benchmark Routine Improvements
  - Improved the Benchmark Routine to allow users multiple options.
    - Selecting the 'Rename' option will create a new point name using the next available point name. The occupation point will then be updated to the new point name and the existing backsight solution. The elevation used will be the current Reference Elevation.
    - Select Update Elevation and the instrument setup is used and the elevation from Ref Elevation is used for the new point.
    - Select 'Update HI' and this allows users to update the HI (Occupation) based on the Reference Elevation and not change the control point.
- GNSS
  - Added the ability to Manage logged files on the internal receiver memory. Users can:
    - View the list of raw data files Delete selected file(s)Download selected files(s)
  - Improved Edit Raw Data to allow users to tap and hold on a point to quickly open the Base Station dialog.
  - Removed the following legacy Sokkia receivers: GSR2700ISX
  - Improved GNSS support with Advanced Epoch filtering. This improvement

allows measurement to not be stored until the specified number of epochs have been measured at the specified HRMS/VRMS values

- Added support for the TILT in Localization. Users now have the option to show the TILT bubble when measuring GNSS points.
- Updated the NTRIP messages. After connecting to a mountpoint, MAGNET Field now displays a message informing the user the mount point they are connected. The Raw data also shows the Mount point Info, and when exporting Raw Data the mount point information is included in the file.
- Improved the NTRIP username/password option. Added the option in the NTRIP connection dialog to show the username and password. This allows users to make sure their credentials are correct before connecting to the mount point.
- Added repeater configuration support for the R2 Lite FH/UHF radio
- Added the Reference station ID to the Map Label options
- Updated the antenna database to the latest NGS Calibrations

## mmGPS support

- When connected to a mmGPS transmitter, the channel number is now displayed on the map screen. This makes it easier for the user to identify what transmitter channel they are working with if they have multiple setups on different channels.

## • Total Stations

- Updated the GTL-1000 support to allow users to select the resolution of the intensity image to transfer to the Field Controller, or the option to not transfer an image to the controller if it is not needed.
- Improved GTL-1000 support to continue the Shift Scan routine when the batteries are changed on the instrument.
- Improved Resection so you can accept the results after measuring two points. This improvement helps in situations where the third point is not available. In previous versions, users would have to re-observe all points.
- Added Offset measurement options to resection setup. Offsets are now available for Horizontal Angle Offset, Horiz/Vert Offset and Distance Output.

- Added the ability to modify the prism pole height from the resection results screen.
- Updated the OnBoard install to allow users to install MAGNET Field on the OS/FX-200 via USB stick.
- Added support to manage and connect to Optical instruments via LongLink. Users can now use a LongLink connection via GNSS receivers to configure and connect and control their Total Stations.
- Added the option in Edit > Prisms to create 360 degree prisms. Users can now create custom 360 prisms and include the aperture.
- Added the option to edit the prism constant from the HR button.
- When connected to a conventional instrument (ES-105 for example), the angle to turn to the point being staked is now a live value and displays without first having to measure a distance
- Improved prism management allowing users to reorder the prism list so the most used prisms can be put at the top of the list and easier to find and select.
- Improved the predefined point selection dialog in Set Collection. The Edit option in the HR button allows you to select and edit the prism constant rather than having separate controls.
- Improved instrument configuration to support receiving current Temperature/pressure/humidity/PPM from the instrument.
- Added access to the search/lock function from the Virtual Joystick.
- Levels
  - Allow users to select a point in the point list and change it from a FS to a SS
  - Allow users to select a point from the list and 'Remeasure' the point.
  - Improved the Two Peg test to display only the error in Height in mm/m or hundredths of foot/feet
  - Updated Digital Level support to allow the horizontal position from GNSS/TS measurements and the Height from levels.
- SiteLink 2
  - Added a browse folder option to the SiteLink 2 connection so users can select

the folder to send files.

- Coordinate Systems/Geoids/Etc
  - Added WA Grid System 2020 (Australia)
  - Added support for Spanish Geoids
  - Added the option to download a Geoid file from the internet in the Coordinate System dialog. In previous versions, users would have to install Geoids when MAGNET Field was updated or installed.



## Resolved Issues

The following issues have been addressed in MAGNET Field 7.

- Addressed an issue with KOF export format. The export of the KOF format with Data type set to Multiple has been updated to have the same code and not different codes for the start point.
- Addressed an issue with Alarms. The AutoStore alarm would not notify users when the measurement was stored
- Addressed an issue with depth sounders. When connected to the Hydro Echo Sounder, no depth values were sent to MAGNET Field.
- Addressed an issue with Resection setup and Reference Elevation. If a null elevation was used for the occupied point, the point will not update with the Reference Elevation
- Addressed an issue with WMS services. The service has been updated to support TM35FIN mapping service
- Updated exporting a picture with GeoTags. The coordinates were wrong in the export
- Addressed an issue with point display in Edit Points. At times points would appear to have been measured with TILT when TILT was not used on the point.
- When sending NMEA GPR message from the Field Controller, for certain projections, the output was only 2 decimal places. The output has been updated to include 3 decimal places.
- Updated KOF output format to correctly export the RMS values when TILT is used.
- Updated SHP file export to correctly export the projection information to ESRI Shape zipped (\*.zip), ESRI Shape (\*.shp).
- Addressed an issue with the gts7 file format. When exporting the file that contained direct/reverse observations for the Backsight, only the direct observation was exported.
- Addressed an issue in Resection when configured for Hybrid. When using a custom prism and top of the pole for rod height measurement, the center offset for the prism was not always applied.
- Addressed an issue when exporting to the Belgische Kadaster (\*.txt) format. The export would not finish and create the txt file.

- Corrected an issue when exporting Trimble \*.dc files. The DC file now correctly imports to Trimble software
- Addressed an issue in the export to the \*.RW5 format. The export now includes HRMS/VRMS, Satellites, PDOP and, Status.
- Addressed an issue in traverse adjustment when the traverse is in grid coordinates. When computing the traverse, the grid scale factor was not applied. Instead, the scale factor of 1.0 was applied to the computations.
- Updated support for Spanish projections. The SPAIN-xx UTM ED50 projections were assigned the EURO50 Datum and the correct datum is NTV2SPAIN.
- Addressed an issue in the Normal View when an RTCM Online Transformation is used. In the display, the normal view always showed the Ellipsoidal Ht and not the Height.
- Addressed an issue with Backsight Checks. The distance checks would display 0 but the raw data showed the correct backsight check error values.
- Addressed an issue when importing roads in LandXML files. The road coordinates in the file were always treated as ground coordinates.

## MAGNET Field Layout -V7.0

### General

## Magnet Field Layout V7 Release Notes

The following new additions/revisions have been made to Magnet Field Layout V 7.0.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### General Functionality

#### New Features and Improvements

- Updated Default Menu:
  - The default menu has been simplified and now includes industry standard nomenclature. Both new installs and updates to existing installs of MAGNET Field Layout will now default to this simplified menu.
    - For existing users who have either a custom menu layout or prefer the 'full' menu, they are available under M > Configure Menus.
    - For uses of the GTL-1000, the scanning features are available in either the full menu, or it can be enabled in the default layout menu. To enable the scanning features, from the home screen, select M>Configure Menus and select 'Scanning'.
- Reporting:
  - Added headers to stake reports and users can now add company logos to Reports. The 'Report Header' feature is available under 'Reports' and allows you to select a logo for your Field and Stake Reports.
  - Added support in COGO calculations to save COGO calculations to Field Reports

and export as a PDF. Users can now combine all field reports to a single file for export.

- Headers have been added to stake reports and include: Job Name, Date, Time, Surveyor/user
  - Units are now added to Stake reports
  - Improved Field Reports to allow multiple images to be attached to a report.
  - Added the option to export multiple deviation report types to a single PDF.
  - Improved deviation reports and optimized the column width when exporting to a PDF.
- Planes:
    - Added the ability to create planes in MAGNET Field Layout. Planes can be defined by the following methods:
    - Horizontal
    - Vertical
    - Sloping
    - 3-Points

Horizontal, Vertical and sloping planes are defined by a point and direction. The bounds of the plane is defined by the distance from the point in the X and Y direction.

Sloping planes allow you to define the crossfall and mainfall slope of the plane.

Defining planes by three points allow you to pick any three points in the job to define the direction and slope of the plane. You can also set the dimensions of the plane based on the distance X and Y from the center of the plane.

Users can also define the properties of a Plane (Layer, Style, Color) as well as fill type and line styles for the plane.

- Custom Symbols
  - Custom symbols allow the user of CAD 'type' symbols in MAGNET Field Layout and include:
    - 2D and 3D User Defined Symbol support
    - Edit and manage custom symbols

- Import custom symbols from MAGNET Office
  - Draw custom symbols on 2D and 3D map
  - Updated list of standard symbols to include many additional symbol types that are available in AutoCAD
  - Updated the Modify Layer tab in Edit Point to allow users to modify Codes and support symbol selection in the Point symbols dialog
  - Update the Modify Add/Edit code dialog to support custom symbols
  - Added the Custom Symbols menu item to Main Menu>Configure>Codes>M
  - Added a new option to edit the Symbol Properties (name, scale, rotation, description)
  - Added support for common Electrical symbols
- Import/Export
    - Added \*.csv as an option to:
      - Topcon Text Custom
      - Topcon Text Custom QA
      - Topcon Text Report
    - Updated Topcon Text Custom Fixed to allow specifying the Field length and alignment of columns
    - Updated SHP export to include QA data with each point, generated as attributes for the point. The export now includes: Date & Time, #SV, GNSS Solution Type, RMS, PDOP. Improved SHP file export to include X,Y,Z (position information) as attributes to the Shapefile. Raw data output (SDR and RW5 formats) now includes the measurement type (Prism/Reflectorless/Sheet)
    - Added the prism constant to export Raw Data/LandXML output format.DGN Export. Added Point Number and Code to the dgn format export option. Previously only X,Y,Z was exported for points.
    - MaXML 1.5 Import/Export new data types:
      - Custom symbols
      - Background Images

- Network RTK information
- Full Optical Prism information
- Multiple photos attached to a Field Report
- Added support for Import/Export of Custom Symbols between Jobs
- Added support for Import/Export of Custom Planes between Jobs
- Improved \*.txt formats and now allow users to order the export file by Point Name.
- Added the option to directly import linework to a job. Previously, linework was only imported as a background vector image.
- Improved raw data export to include instrument details (instrument name, serial number and ROM version) to the raw data formats that support the additional data.
  
- Enter Plan
  - Added the ability to display lengths in Enter Plan
  - Added the option to add/edit the name of points as they are calculated
  - Added the option to extend the length of an existing line.
  - Added the option 'Store+' for linework. This option allows the user to continue the current command.
  - Added a 'direction' arrow showing the user the direction the next element is going.
  
  - Added the option to create an arc with two points and a radius.
  
- COGO
  - Added the Map page to COGO results. Users can now view their COGO calcs on the map in the following Inverse routines:
    - Point in Direction, Curve calcs, Traverse, Corner Angle, 3D Corner Angle Offsets, Spiral Solution, Vertical Angle and, Triangle calcs
  
    - Added 'Backsight Adjustment' to the Setup menu group. Allows users to transform all points in a job. This option now allows you to select:

- 2D Transform, Rotate or Translate as options to modify Total Station job data..
  
- Languages
  - Added support for Hungarian
  
- Map
  - Added the option to Lock Layers in background dwgs. Users can lock layers so the linework remains visible but is not selectable.
  - Added the option in Map Properties to show line dimensions. Dimensions will show when linework is selected.
  - Improved the Fillet snaps command to create a single arc. Previous versions created two separate arcs.
  - Improved the snap toolbar action to allow users to edit the point created from the map context menu
  - Improved support of WMS in MAGNET Field. Additional mapping services have been added to the support service list.
  - Improved switching to 2D to 3D mode so zoom levels are now retained.
  - Added Codes and Notes Mode to As-Built. There is now a second field in the Normal view that is selectable so the user can select between a second Code field or a Notes Field.
  - Improved point numbering with As-Built and Setup. Point numbering for Setup Occupation points and As-Built points can now be separate. For example, if the last As-Built point was 200, you can name your setup point 300, 301, etc and when returning to As-Built, the next point will be 201, so the sequence is now lasttopoint+1.
  - Improved the point list so when selecting a point on the list, the point is now highlighted on the preview map.
  - Improved the overhead view to show the TS location, the BS Prism location and the orientation between and to the design point.
  - Added the option to Edit the Prism Height in the Resection results screen. This ability also automatically recomputes the resection results eliminating the need to re-observe the resection points

- Added the option in Edit Points to set any observed point as a Control Point
- When connected to a conventional instrument (ES-105 for example), the angle to turn to the point being staked is now a live value and displays without first having to measure a distance.
- Reference Elevation Routine Improvements
  - Improved the Reference Elevation Routine to allow users multiple options.
    - Selecting the 'Rename' option will create a new point name using the next available point name. The occupation point will then be updated to the new point name and the existing backsight solution. The elevation used will be the current Reference Elevation.
    - Select Update Elevation and the instrument setup is used and the elevation from Ref Elevation is used for the new point.
    - Select 'Update HI' and this allows users to update the HI (Occupation) based on the Reference Elevation and not change the control point.
- Levels
  - Allow users to select a point in the point list and change it from FS to SS
  - Allow users to select a point from the list and 'Remeasure' the point.
  - Improved the Two Peg test to display only the error in Height in mm/m or hundredths of foot/feet
- Total Stations
  - Updated the GTL-1000 support to allow users to select the resolution of the image or the option to not transfer an image to the controller if it is not needed.
  - Improved GTL-1000 support to continue the Shift Scan routine when the batteries are changed on the instrument.
  - Improved Resection so you can accept the results after measuring two points. This improvement helps in situations where the third point is not available. In previous versions, users would have to re-observe all points.
  - Added Offset measurement options to resection setup. Offsets are now available for Horizontal Angle Offset, Horiz/Vert Offset and Distance Output.



- Added the option in Edit > Prisms to create 360 degree prisms. Users can now create custom 360 prisms and include the aperture.
- Improved prism management allowing users to reorder the prism list so the most used prisms can be put at the top of the list and easier to find and select.
- Improved instrument configuration to support receiving current Temperature/pressure/humidity/PPM from the instrument
  
- **Drape Mode**
  - Added the option to set a plane for multiple points. Users can now define the Plane (Floor, Wall, Ceiling) to drape point(s). Additional options include finding a new plane for each point and, using an existing plane for points.
  - Added an option in the stake map to adjust the defined surface. Users can define the surface to drape points and adjust the surface from the MAP screen. This helps if the surface is out of level for example, the user can re-run the routine to tighten up the surface you are projecting points.
  
- **Additional Improvements**
  - Added Job Photos to the Apps menu. This allows users to view Photo Notes in the job.
  - Support 3D lengths in Layout. This option allows you to layout items (pipes) along the 3D and not just 2D (Hz) length.

## **Resolved Issues**

The following issues have been addressed in MAGNET Field Layout V7.

- Addressed an issue with Alarms. The AutoStore alarm would not notify users when the

measurement was stored

- Addressed an issue with Resection setup and Reference Elevation. If a null elevation is used for the occupied point, the point will not update with the Reference Elevation
- Addressed an issue with WMS services. The service has been updated to support TM35FIN mapping service
- Updated exporting a picture with GeoTags. The coordinates were wrong in the export.
- Updated SHP file export to correctly export the projection information to ESRI Shape zipped (\*.zip), ESRI Shape (\*.shp).
- Addressed an issue with Backsight Checks. The distance checks would display 0 but the raw data showed the correct backsight check error values.

## MAGNET Construction - V7.0

### General

### Magnet Construction V7 Release Notes:

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

### General Functionality

#### New Features and Improvements

- Check IN/OUT functionality has been improved to revise the license validation logic. The validation check is now determined by the activation process. To enable the Check In/Out functionality the license must be activated using the "Online" method. The

“online” method is completed using the in-application activation workflow. “Offline” activation is completed by accessing the Magnet Enterprise or Topcon Positioning website for activation. Product Activation is accessed from the vertical Apps bar located on the left side of the webpage. Once signed into the website options available to the user will appear in this vertical app bar.

This workflow requires entry of the device id for the device the software is installed on as well as entry of an authorization code generated and displayed during the offline activation workflow.

Note: Check In/out functionality is not available when using the following activation methods or license types.

- Offline activation
    - Perpetual license
    - Subscription license
  - Activation to a USB key
    - Perpetual license
    - Subscription license
  - Educational licenses
  - Perpetual with expired Service Plan
  - Trial licenses
- 
- Performance - Improved and optimised various areas of the program for efficiency including opening, import/Export, Data Clean up, DTM functions, large jobs etc.
  - Object Selection has been updated to support holding the CTRL key and dragging a window around data to be removed from a selection.
  - Modeless Panels can now be collapsed if undocked by clicking on the top left corner of dialog.
  - Select Path by Bounded Area is a new option accessed from the right mouse button menu. This option allows the creation of a closed object, string, polygon, boundary, lot, pad by picking inside a bounded area. The bounded area can be enclosed by multiple objects. The routine will highlight the determined area and prompt for confirmation.
  - Asset Design as Constructed (ADAC) export support has been added to the Survey ribbon. The functionality for preparation of the ADAC.XML file is accessed via the ADAC Data Manager. Once the project data is defined and categorized based on ADAC guidelines an export option is available for creation of the ADAC.xml file for submittal. )
  - Import/Export
    - Added Import/Export support for Lidar point cloud LAS files (\*.las, \*.laz).

- Added Export to SurPac string format (\*.str)
- Added Import/Export of KMZ and Export of KML files.
- Added Import of Japanese XML format.
- DWG format
  - Updated to included option to export metric jobs to millimeters.
  - Updated to include “tadpole” arrows for side slope (batters) indicators
  - Import linetypes supported
  - Export improved to support export of point elevations with Use in Surface ON. Elevations of point with Use in Surface off are exported with elevation 0.
- MJF Import/Export has been updated to support Magnet Field custom symbols.
- Cloud Connections
  - Added support for connecting to Sitelink 3D V1 and V2 Sites from the Cloud Connections ribbon, Sitelink 3D ribbon group.
- Modeless Properties UI - The properties toolbar has been updated to a modeless user interface. This UI can be opened and used as a docked panel with autohide capability or a floating panel. All object property modification is done from this UI. The new Properties panel replaces the Edit Group Properties and the individual entity properties dialog accessed by double clicking on an entity.

When a layer is selected as the current layer, the properties are set to “bylayer” by default. This is a change from the legacy logic of properties defined by entity and is consistent with typical CAD programs. The ability to set properties by entity was retained.

  - Object limit for Properties Manager is a new setting added to the Program Settings, Preferences tab. The recommended and default value for this setting is 25,000; the maximum setting is 30,000. When the specified limit is met, the properties UI will list “varies” for each object property. This does not prevent the changing of properties for selections over the specified limit only the listing of the individual property settings.
- Selection Cycling is a new option located in the Program Settings, Preferences tab and the Settings ribbon for quickly turning on and off. By default, this setting is on. When ON, selecting objects that are overlaying other objects or points which are near other points, a dialog is displayed listing the objects available for cycling. To select the data to work with, select it from the list. When multiple points are listed in the cycle list, the keyboard arrows can be used to browse the listed points. The selected point is

highlighted during browsing the points.

- Create Entity has been improved to include
  - Create the next point or point included in linework based on slope
  - Support right mouse button menu option Select by bounded Area
- Previous Selection has been improved to reselect all data included in the last selection set. This option is in the Right Mouse Button context menu and the Edit ribbon.
- 3D View has been improved by adding new options.
  - New 3D Tab has been renamed to 3D View. By default, the 3D view opens as a vertical tab. This tab can be added to the Survey tab to go to a maximized view or can be placed on an additional monitor.
  - A new option 2D/3D Split has been added. This option splits the main view into two areas, the left side is 2D the right side is 3D. The size of the areas can be adjusted by dragging the borders to the desired size. Each area has its own functionality set which is accessed from the various accessible ribbons in each area.  
The 2D/3D Split icon acts a toggle to access the view and to close the view.
  - 3D Toggle has been removed
  - 3D project views now close when the project is closed.
- Lot Annotation and Report has been improved to include the optional label of the perimeter distance in the survey view as well as the lot report.
- Inquire Area has been updated to better support area calculations of areas bounded by objects without points.
- Create Plot Window has added a "Total Sheets" input field for plotting multiple sheets. When the "Apply" option is toggled on the field will read the total number of sheets based on the number of sheets created. The field allows for manual edit of the total sheet number when required.
- Extract Drawing is a new option to create a polygon from a plot window (drawing). Plot windows must be displayed using the "Show" option from the Plot Window ribbon group. The option is available in the right mouse button menu when the cursor is located within the Plot window (Drawing) limits.
- Drawing View – added a "color" setting in the North Arrow dialog.
- Selectby has been updated to include the option to select data by Layer Groups.
- Edit Points

- Added support for manually renaming individual point names/numbers.
- Added message when there are no results generated based on selected search filters.
- Quick Profile
  - Improved to highlight the profile reference line in the Survey view.
  - Added Text Style settings in the display settings to allow size/font to be configured for the DTM name

## DTM (Surface) Functionality

### New Features and Improvements

- Planes – Added functionality to create, edit, display and delete Planes for use in 3DMC and Magnet Field.
  - Planes are displayed in the Survey (CAD) view based on the defined grid settings, specified surface point and defined orientation.
- Merge DTMs – improved the speed of merging large dtms.
- Create Cut/Fill DTM
  - Updated to optionally include a color fill legend as the last step of the dtm creation. The outline of the legend is displayed for positioning in the drawing. To not insert the legend, press the escape key when the outline is displayed.
  - Cut/Fill dtms, when created, will be set to the current dtm for quick inspection of depths in the information toolbar.
  - Added optional compaction coefficient, labeled “Diff Compaction for Fill”. This results in a CF dtm that reflects the depth required to meet a compaction requirement. For example, a 1-foot layer of asphalt with a 10% compaction coefficient would require 1.10’ of depth.
- Insert Legend is a new option located in the DTM Tools dropdown menu. This option inserts a dtm color fill or slope fill/arrow legend in the survey and drawing views. Multiple legends can be inserted for showing color fill shading for multiple dtms individually. Legends can be selected and repositioned at any time. Functionality is supported in Drawing view as well.
- Edit Contour Label is a new option in the Surface ribbon. This allows for manually

positioning new contour labels and editing the position of existing labels. Contour labels option in the DTM settings must be on.

- Slope Zone Report – A new optional slope report has been added to the dtm report function. When slope arrows or slope shading is on generating a dtm report will include a report of the slope ranges and their corresponding area.
- Simplify DTM, located in the DTM Tools dropdown, is a new option to simplify a specified DTM. Simplification of the DTM can be accomplished using one of two options, Edge Contraction or Point Reduction. The selected DTM can be updated or a new DTM created by the simplification. This option is useful for reducing the size of a dtm.
- DTM Manager
  - New controls for triangle display in the 3D and 2D/3D Split views have added in the “3D View Display” DTM Manger dialog group.
    - Solid – shows triangular mesh as a solid color. Color is defined by the mesh color. This option is the default setting
    - Mesh – shows the mesh only
    - Solid + Mesh – shows mesh and solid
    - Settings are applied and retained per DTM
- DTM Tools
  - Export DTM has been updated to include the option to export a dtm as a Trimble Tin Model (\*.ttm) file.
- Merge DTM performance has been improved to speed up the process of merging large dtms.
- DTM Editor - A new modeless DTM Editor UI has been implemented and is accessed from the DTM Ribbon, Create/Edit DTM ribbon group. This UI can always remain open and allows access to other functionality while open. DTM modifications are immediately reflected in the contour configuration and color fill shading if present. The following list of commands have been either moved to or replaced by the new DTM Editor.

#### Moved

- Delete Triangle
- Delete by Line
- Delete by boundary
- Delete by Length or Angle
- Add Triangle



- Swap Triangles
- Decompose Triangle

#### Replaced

- Modify DTM

#### DTM Editor New Functionality

The DTM Editor is made up of four tabs, Delete Triangles, Add Triangles, Surface Data, and Surface Points.

- Pick is a new option that allows the selection of the dtm to edit by simply picking within the boundary of a dtm. To use select the Pick button and pick inside a dtm boundary. This option is also good for identifying dtms when multiple dtms are present. When picked the dtm will briefly shade indicating the dtm selected.
- Highlight is a new option that briefly highlights a dtm specified in the DTM Editor. This is used to confirm the correct selection of the dtm to edit.
- Selection of Triangles for deletion - Triangle deletion can now be accomplished by using selection windows or crossing windows as well as the single pick inside of a triangle.
- Confirm on Delete is now an option, when off deletion is immediate.
- Re-Triangulate on Delete – this option will retriangulate areas where triangles have been deleted during the deletion process. It is also available when Deleting Data or Removing Surface points.
- Fill Gaps is a new option to fill in areas of no triangles quickly. An area to fill can be identified by a single pick with the area or multiple areas can be identified by forming a window around all the areas or by windowing in the entire dtm.
- Add Data is a new option to add within or outside of a dtm boundary. When an object is selected, such as a string, line or polygon, the points linked to the object are selected and the breakline setting for the object is used.
- Add Data within Window is a new option that allows data to be selected by a window selection and add it to the dtm being modified. Triangles created are only within the window formed. This allows for quickly combining multiple dtms into one dtm.
- Delete by Data allows for the deletion of data from a dtm by selecting objects with linked points or points only.
- Edit Surface Point Elevation allows for modifying the elevation of any surface point contained in the dtm. An option is provided to update the linked point if

applicable.

- Create Surface Point allows the creation of a surface point within or outside the dtm boundary. When picking inside the boundary the interpolated elevation of the surface point will display in the dialog. This value can be edited another value. If picking outside the dtm boundary the average elevation of the dtm will be displayed in the dialog. This value can be set to the desired elevation. Note that surface points are not named points and not stored in the point database. If the surface points are required for use in the survey view us the Create Points from DTM option to write them to points database.
- Remove Surface Points allows for removing surface data points from a dtm. Points can be removed individually, or multiple points can be removed using a window selection. The option to Retriangulate on Delete is available for use with this option.
- Undo/Redo in now supported for the delete/add triangles options as well as data additions/deletions or surface point elevation modifications.

## Pad Design

- Multi Pads is a new pad design function. This allows for the design of multiple pads at the same time. Specify a reference surface and the design constraints for each pad such as elevation and side slopes (batters).
  - Side slope layer selection
  - Option to add the side slope layer to the Design layer group for takeoff calculations.
  - Option to create Pads dtm (new dtm created by merging the reference and pads dtm) or create a pad only dtm by using the Trim to Side Slopes option.
  - Located in the Design Ribbon.

## Corridor/Road View Functionality

- Cross Section Lines is a new option located in the Design ribbon, Cross section group. This allows for the permanent display of section line locations defined in a corridor, road or any design function requiring cross sections and an alignment. Settings for the section lines and labels are provided in the Cross-Section Line dialog.
- Corridor & Cross Section Set - Grade Sheet Report

- Updated to support cross section sets in addition to corridors.
- Updated to include landscape setting for the report
- Corridor Cross Section Viewer has been revised to display/hide cross slopes for any surface selected for use in the cross section set. This option is in the graphic view Settings dialog.
- Corridor Vertical Alignment Editor now includes:
  - Option to Raise/Lower IP by station range.
  - Option to pick IP elevation by picking an existing point in the survey view or by picking a location and interpolating the elevation based on the dtm set as current in the project.
  - Now allows for selection of data in read only fields for use with copy/paste functions.
  - Added support for vertical alignment plotting. Basic plot settings displayed by default but can be expanded to advanced settings.
- Corridor Template, Cross Section View, and Corridor Zone Widths/Slopes Editors have been updated to support Station Equation stationing when using the slider bar.
- Road View, Profile/Long Section functionality has been updated to include the option to compute VC's based on station/chainage range.
- Road View, Cross Section Plot
  - Added new options when including service strings in cross section plots to include labels for Offset, Elevation and/or Depth of service strings.
- Horizontal Alignment curve information has been improved to update terminology and display in larger text.

## Resurface Functionality

## New Features and Improvements

- Resurface Design now supports IRI (International Roughness Index) calculations from the longitudinal profiles of the design. IRI reports and graphs have been added.
- Alignment Window has been updated to include new options listed below.

- Select Station Range. This is a new option that allows for the selection of the area of work, start and end marks, by forming a window around the desire area in the alignment window. The option can be accessed by the following methods:
  - Right mouse button menu
  - Keyboard shortcut of CTRL+R
  - Alignment Ribbon, alignment ribbon group
- Quick Display Toggle for
  - Fill/Milling area
  - Paving Thickness
  - Milling Depth Stations
  - IRI values
- Cross Section Window has been updated to include new options listed below.
  - Quick Display Toggle for :
    - Fill
    - Cut
    - Depth
    - Design Elev
    - Natural Elev
- Profile Window
  - Quick Display toggle for :
    - IP Comments
    - IRI Values
- Profile IP Comments have been improved to include a Large and Normal setting for the comment text. In addition, the labels can now be positioned either horizontally or vertically. The comment position setting is located on the Resurface Settings tab as a dropdown beside the comment label toggle.
- Profile IP Details – added a new field “Adjust Level Increment”. This allows for entry of an incremental adjustment value for modification of the IP Level. The Up/Down arrows located beside the field is used to adjust the level up or down.
- Station Equations – All applicable resurface design dialogs have been updated to support station equations.

- Insert Ortho Photos (Background Images)
  - Updated to include the ability to set the units for the importing images. By default, the unit is set to meters which is typically the units used in geo-referenced images.
  - Batch insertion of geo-referenced images, multiple images, has been revised to display the insertion dialog so that the transparency of the images can be defined on import.
  - Background Image Transparency setting has been improved to support multiple image transparency modification.
- Exclusion Areas have been added to the Resurface design view. Exclusion areas are not included in the area and volume calculations of the resurface design.
- Exclusion areas are shown in each design window of the Resurface design view.
  - Add Exclusion area – identifies an area for exclusion
    - By String – requires selection of a reference string and an exclusion string.
    - By Offsets – requires selection of a reference string, From Station and End Station, Start and End offsets and sides for offsets.
  - Delete Exclusion area – use to delete defined exclusion areas.
  - Reporting – Exclusion areas are included in the “Summary Report” section of the Resurface Report.
- Improved performance for saving and opening resurface projects.

## Takeoff Functionality

- Mass Haul Analysis has been updated to support the transfer of the following data from Magnet Office to Project (mass haul/scheduling functionality)
  - All Takeoff types are now included in the transfer to the mass haul/scheduling functionality of Magnet Project. These include Count, Length, Area and Volume types.
  - Job data displayed in the Survey view of Magnet Office is now transferred to Magnet Project as a background image. The background image is displayed in the Map view of the mass haul/scheduling (Project) functionality.
- Settings – when performing a specific design element takeoff, such as a road, trench or corridor, site boundary selection is no longer required. Site boundaries are required with

a total site takeoff including various design elements.

- Takeoff Ribbon has been updated to separate takeoff preparation into Site and Design Element takeoff calculations. The settings dialog has been updated to include settings to support layer group takeoff, surface takeoff, and material only takeoffs with options to include Strata data from borehole input and/or surfaces representing strata.
- Trench Design has been revised to include a new design logic and UI for creating pipe trenches.
  - Basic and Advanced design modes.
    - Basic mode support single pipes only and trench depth, width, over excavate depth, backfill materials and tie slopes to original ground.
    - Advance mode supports all the basic design functions and additionally
      - multiple pipes with horizontal and vertical offsets from centerline of trench.
      - Additional trench template instructions for benching and complex trench design.
  - Horizontal and vertical alignments are now supported
  - Trenches can now be defined as a depth from the existing surface or defined by a vertical alignment.
  - Supports multiple pipes
  - Supports benching within trench (advanced mode)
  - Digitize Trench Profile is a new option to quickly create trench profiles (vertical alignments) using the horizontal and vertical profile grids contained in pdf and dwg files containing trench designs.
  - Trench templates can now be created and added to the Trench Template library for repeated use.
  - Additional options for trenching
    - Quantity report
    - Depth Zones
    - Depth Report
    - Depth Plot

## Modeler/Explorer Functionality

As Magnet Office works to integrate new technologies and features, the importance of creating feature sets shared across Magnet Office products is critical. For this reason, Magnet Explorer and Modeler applications have been combined into a new single user interface with improved functionality.

The new interface provides tools to easily and quickly assign 3D elements to layers to create a 3D visualization of the data.

## Improvements

- Magnet Office Modeler ribbon icons
  - Create New – creates new 3D Model
  - Open – opens an existing Modeler 3D Model (\*.mjm) file
  - Update – updates the corresponding 3D Model created from Magnet Office with any changes or additions made in office.
- New 3D graphics engine
- New high-quality textures and 3D objects
- Templates are used to manage Styles, Materials and Object elements which are required for 3D Modeler creation.
- Styles, Materials and Objects each provide options to create new specific user defined elements.
- In addition to the Materials, Objects and textures provided, additional user defined or purchased Materials, Objects and textures can be used.
- Layer rules are provided for grouping of layers to a specific model element. A powerful wildcard matching function can be used to easily group layers.
- A new 3D Graphic engine is included which support high resolution images and complex 3D objects. The visualization quality of the model has been greatly improved.
- A new three section interface is provided. This includes a command and definition panel on the left, a 2D view (center) and a 3D view (Right).
- The 2D view includes a 3D view toggle in order to view, rotate and pan the CAD data in 3D.
- The 2D and 3D views can be synchronized for viewing by toggling on the synchronization

option located at the bottom of the 2D/3D window area.

- A layer list is provided in the definition panel. Layers selected in the list will be highlighted in the 2D view. Objects selected in the 2D/3D view will highlight the corresponding layer in the list.
- Layers from the 2D view can be added to the 3D view using the Add Layer option in the 3D Layer panel in the 3D view.
- Modeler UI - Import, "Update 2D Drawing" supports various file types for import. These include:
  - Autodesk drawing (\*.dwg)
  - Bentley Microstation (\*.dgn)
  - Topcon formats:
    - Magnet Field, Magnet Tools, Magnet Office (\*.mxi)
    - Magnet Office job (\*.mjo)
    - 3DMC project (\*.TP3)
- New Magnet Model file extension \*.mjm is created when saving the model.
- 3D View Controls
  - Auto Regeneration on/off toggle
  - Re-generate model toggle
  - 3D Layer Panel
  - Home button to reset the camera position

#### Workflow Example

- Create magnet office mjo, containing linework, points, surfaces etc.
- From the Modeler ribbon select Create New. It is recommended to use one of the existing templates provided in lieu of starting from scratch. Existing templates include defined styles, materials and objects which make it easier to create a personal user template.
- Within the Modeler interface, either assign layer rules or simply assign styles to specific layers.
- The 3D window updates immediately with the selected style.
- Save the model and/or publish to Magnet Live for collaboration exercises.



## Magnet Tools

### General

- Installation of the Civil 3D MAGNET ribbon is now optional during installation.
- Added support of Planes
  - Show and edit in the tabular view.
  - Import/Export by MJF, MaXML, PL3 and TP3.
- Added support for Magnet Field Custom Symbols
- Improved data entry UI in Manual TS Data
  - Allows for data entry in grid of tabular view
  - Properties button added to all manual data entry dialogs
  - Added automatic point number advancement to manual TS data entry dialog
- Enterprise ribbon
  - Removed Chat, Schedule/Timecard functionality
  - Removed News icon
  
- Check IN/OUT functionality has been improved to revise the license validation logic. The validation check is now determined by the activation process. To enable the Check In/Out functionality the license must be activated using the "Online" method. The "online" method is completed using the in-application activation workflow. "Offline" activation is completed by accessing the Magnet Enterprise or Topcon Positioning website for activation. Product Activation is accessed from the vertical Apps bar located on the left side of the webpage. Once signed into the website options available to the user will appear in this vertical app bar.

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  - Perpetual license
  - Subscription license
- Activation to a USB key
  - Perpetual license
  - Subscription license
- Educational licenses
- Perpetual with expired Service Plan
- Trial licenses

## Coordinate Systems

- Additional settings for datums such as NAD27, NAD27(CSRS) and NAD83(CSRS) are now centrally located in the Settings dialog accessed from the Job Configuration UI.
- Added optional display of Ellipsoidal height together with Elevation in the Points tabular view.
- Added "Datum (Xc/Yc/Zc to the Tabular view for display of any datum XYZ coordinates.
- Added Support of equidistance cylindrical projections for maps.
- Added Egyptian projections.
- Updated Singapore geoid SGEOID09
- Added Estonian geoid EST-GEOID2017
- Added Spain datum NTV2SPAIN

## User Interface

- Added Tooltips to tabular view headers for full name viewing
- Standardized Ephemeris header titles
- Updated term GPS to GNSS in tabular view and applicable views.

## Import/Export

- Added support for transferring text labels to AutoCAD dwg files.
- Updated export custom format to support adding label for undefined coordinate. When defining a custom format, the option Use Coordinate Placeholder option allows for entering a label for the placeholder.
- Added import/export support for Geocomp files.

## Adjustment

- The Process ribbon has been updated to include two new icons, Adjustment by Least Squares and TS-Traverse Adjustment by Compass Rule. The setting for default adjustment type has been removed from the Configuration dialog.
- Added normalized residuals to the rejection criterion options in the Process Properties of Least Squares adjustment. The following residual types are available:
  - X Y Z
  - N E U

- Distance Angle Elevation
- Updated Blunder Treatment options to include “Automatic Blunder Reweighting”.
- GPS Loop Closure user interface has been improved.

## Reports

- New table format templates are provided which allows for table and cell formatting. The following reports were replaced with this new format.
  - Localization
  - Field Report
  - Adjustment
  - Project
- Added Import/Export support for reports. This allows for transfer of report formats to and from other computers running Magnet Tools.
- GNSS Observation report; added new fields relating to precision and adjustment.
  - Error circles and error ellipses
  - Normalized residual (Standardized residual)
  - From point code and To point code columns
  - Vertical error and selected confidence level
  - Time only field (Start Time)
  - GPOD values
- TS Observation report new fields for reporting
  - Added option to report x,y,z of target point
  - Normalized residual (Standardized residual)
- Point report new fields for reporting
  - Error ellipses
  - Circular probable error with selected confidence level
- Field reports
  - Added support for multiple images

## Miscellaneous

- Added filtering of Import from Internet results
- Added Vienna Mapping functions for post processing.
- Added ability to display vector length for non-processed vectors
- GPS Observations improved to support selection of vectors by length and adjacent angles for network selection to be post processed.
- GNSS (GPS) View disable/enable occupations has been improved
  - Part of an occupation can be disabled/enabled by right click on the occupation and selecting disable or enable "SV's in epochs: ??"
  - Optionally the entire occupation can be disabled/enabled by selecting "Enable or Disable SV's: ??"

## Magnet Tools ribbon in AutoCAD and Magnet Exchange for Autodesk

- Support of Civil 3D 2013 and 2014 has been remove and no longer supported.

## MAGNET Layout V7.0

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#### Internet Connectivity

Can be required by some functionality.

### General Functionality

### New Features and Improvements

- Performance - Improved and optimised various areas of the program for efficiency including opening, import/Export, Data Clean up, DTM functions, large jobs

etc.

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  - Object limit for Properties Manager is a new setting added to the Program Settings, Preferences tab. The recommended and default value for this setting is 25,000; the maximum setting is 30,000. When the specified limit is met, the properties UI will list “varies” for each object property. This does not prevent the

changing of properties for selections over the specified limit only the listing of the individual property settings.

- Selection Cycling is a new option located in the Program Settings, Preferences tab and the Settings ribbon for quickly turning on and off. By default, this setting is on. When ON, selecting objects that are overlaying other objects or points which are near other points, a dialog is displayed listing the objects available for cycling. To select the data to work with, select it from the list. When multiple points are listed in the cycle list, the keyboard arrows can be used to browse the listed points. The selected point is highlighted during browsing the points.
- Previous Selection has been improved to reselect all data included in the last selection set. This option is in the Right Mouse Button context menu and the Edit ribbon.
- 3D View has been improved by adding new options.
  - New 3D Tab has been renamed to 3D View. By default, the 3D view opens as a vertical tab. This tab can be added to the Survey tab to go to a maximized view or can be placed on an additional monitor.
  - A new option 2D/3D Split has been added. This option splits the main view into two areas, the left side is 2D the right side is 3D. The size of the areas can be adjusted by dragging the borders to the desired size. Each area has its own functionality set which is accessed from the various accessible ribbons in each area.  
The 2D/3D Split icon acts a toggle to access the view and to close the view.
  - Active 3D views now close when the project is closed.
- Inquire Area has been updated to better support area calculations of areas bounded by objects without points.
- Create Plot Window has added a "Total Sheets" input field for plotting multiple sheets. When the "Apply" option is toggled on the field will read the total number of sheets based on the number of sheets created. The field allows for manual edit of the total sheet number when required.
- Extract Drawing is a new option to create a polygon from a plot window (drawing). Plot windows must be displayed using the "Show" option from the Plot Window ribbon group. The option is available in the right mouse button menu when the cursor is located within the Plot window (Drawing) limits.
- Drawing View – added a "color" setting in the North Arrow dialog.
- Selectby has been updated to include the option to select data by Layer Groups.
- Edit Points

- Added support for manually renaming individual point names/numbers.
- Added message when there are no results generated based on selected search filters.
- Planes – Added functionality to create, edit, display and delete Planes for use in 3DMC and Magnet Field.
  - Planes are displayed in the Survey (CAD) view based on the defined grid settings, specified surface point and defined orientation.
  - Located in the Insert Ribbon



## MAGNET Project - V7.0

### General

### Magnet Project V7 Release Notes:

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

#### Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

#### Processor Speed

2GHz Core2 processor or higher

#### RAM

2GB RAM or more recommended

#### Memory

Local hard drive space of 2GB or higher recommended

#### Computer Resolution

1280x1024 display resolution

#### Internet Connectivity

Can be required by some functionality.

### Project (Mass haul analysis and scheduling functionality)

### New Features

- Added Configure Haul Truck option for connection to Sitelink3D v2 to the Data ribbon.

- Added Import from Haul Truck to the Sitelink3D v2 support. This allows for direct import of haul truck data.
- Added a Resource view.
  - added new option to select the resource types and haul resource types to be shown.
- Added Task Chaining functionality.
- Added ability to zoom to time interval when double clicking on calendar axis. Pertains to Time Location, Gantt and Resource views.
- Added Mass Curve View.
- Added Import of DynaRoad version 5 mass curves.
- Added Task splitting by interval.
- Added option to set Filter dates by dragging date span in calendar axis.
- Added support for updating existing tasks when importing quantities. Supports distribution to multiple different existing tasks containing the same quantity type in the same location.
- Added support for manual creation of hauls.
  - Manual hauls can now be added by simple drag and drop logic.
- Implemented Data Sheets for supported data types. Data sheets are in the Data ribbon and support multi-editing, copy/paste and printing.
- Dependencies include visuals to distinguish between soft and hard dependencies.
- Added Find and Replace text option in all views.
- A Warnings View has been added to the Project ribbon. This view can be docked and shows all potential issues and what objects they affect. This view does not allow editing and only displays information. A potential warning can be double clicked which will open the object window.
- Tasks Work Breakdown Structure (WBS) has been improved to allows for style customization. By default, the WBS code format setting in a Task is empty. This will produce a simple 1.2.3 style formatting. Examples of other supported formats
  - A
  - A
  - 1.A.a
  - Prefix 1.A.a

- Added graphical transitions for objects in the Map View. Objects can be selected and with the options provided in the Right Mouse Button menu and the Home ribbon, can be moved forward and backward for display purposes.

## Improvements

- Mass Haul View
  - Haul leaders now include distance hauled as well as the volume amount.
  - Added optional display of task names.
  - Added option to include Key (legend) when printing. The Key (legend) is printed on a separate page.
- User Interface
  - Panels and views can be used in a docked or float state. Autohide is available in the docked state.
  - Save Window Layout is a new option that allows saving of a defined layout.
  - Apply Window Layout allows for restoring a saved layout.
  - Manage Window Layouts supports the renaming and deleting of saved layouts.
  - Reset Window Layout restores the UI to the default program layout.

## Magnet Office CAD Design/Drafting, 3D Modeling functionality

### General Functionality

#### New Features and Improvements

- Check IN/OUT functionality has been improved to revise the license validation logic. The validation check is now determined by the activation process. To enable the Check In/Out functionality the license must be activated using the “Online” method. The “online” method is completed using the in-application activation workflow. “Offline” activation is completed by accessing the Magnet Enterprise or Topcon Positioning website for activation. Product Activation is accessed from the vertical Apps bar located on the left side of the webpage. Once signed into the website options available to the user will appear in this vertical app bar.

This workflow requires entry of the device id for the device the software is installed on as well as entry of an authorization code generated and displayed during the offline activation workflow.

Note: Check In/out functionality is not available when using the following activation methods or license types.

- Offline activation
    - Perpetual license
    - Subscription license
  - Activation to a USB key
    - Perpetual license
    - Subscription license
  - Educational licenses
  - Perpetual with expired Service Plan
  - Trial licenses
- 
- Performance - Improved and optimised various areas of the program for efficiency including opening, import/Export, Data Clean up, DTM functions, large jobs etc. (All products)
  - Object Selection has been updated to support holding the CTRL key and dragging a window around data to be removed from a selection. (All products)
  - Modeless Panels can now be collapsed if undocked by clicking on the top left corner of dialog. (All products)

- Select Path by Bounded Area is a new option accessed from the right mouse button menu. This option allows the creation of a closed object, string, polygon, boundary, lot, pad by picking inside a bounded area. The bounded area can be enclosed by multiple objects. The routine will highlight the determined area and prompt for confirmation. (All products)
- Asset Design as Constructed (ADAC) export support has been added to the Survey ribbon. The functionality for preparation of the ADAC.XML file is accessed via the ADAC Data Manager. Once the project data is defined and categorized based on ADAC guidelines an export option is available for creation of the ADAC.xml file for submittal. (Survey, Site, Construction, Project)
- Import/Export
  - Added Import/Export support for Lidar point cloud LAS files (\*.las, \*.laz).
  - Added Export to SurPac string format (\*.str)
  - Added Import/Export of KMZ and Export of KML files.
  - Added Import of Japanese XML file format.
  - DWG format
    - Updated to include option to export metric jobs to millimeters.
    - Updated to include “tadpole” arrows for side slope (batters) indicators
    - Import linetypes supported
    - Export improved to support export of point elevations with Use in Surface ON. Elevations of point with Use in Surface off are exported with elevation 0.
  - MJF Import/Export has been updated to support Magnet Field custom symbols.
- Cloud Connections
  - Added support for connecting to Sitelink 3D V1 and V2 Sites from the Cloud Connections ribbon, Sitelink 3D ribbon group.
- Modeless Properties UI - The properties toolbar has been updated to a modeless user interface. This UI can be opened and used as a docked panel with autohide capability or a floating panel. All object property modification can be done from this UI. The new Properties panel replaces the Edit Group Properties and the individual entity properties dialog accessed by double clicking on an entity. When a layer is selected as the current layer, the properties are set to “bylayer” by default. This is a change from the legacy logic of properties defined by entity and is consistent with typical CAD programs. The ability to set properties by entity has been

retained.

- Object limit for Properties Manager is a new setting added to the Program Settings, Preferences tab. The recommended and default value for this setting is 25,000; the maximum setting is 30,000. When the specified limit is met, the properties UI will list “varies” for each object property. This does not prevent the changing of properties for selections over the specified limit only the listing of the individual property settings.
- Selection Cycling is a new option located in the Program Settings, Preferences tab and the Settings ribbon for quickly turning on and off. By default, this setting is on. When ON, selecting objects that are overlaying other objects or points which are near other points, a dialog is displayed listing the objects available for cycling. To select the data to work with, select it from the list. When multiple points are listed in the cycle list, the keyboard arrows can be used to browse the listed points. The selected point is highlighted during browsing the points.
- Points by Elevation Interval is a new Insert Points function. This option creates points between two points with elevation on a user defined elevation interval.
- Scale Points is a new function in the Modify ribbon, points group. This function scales points using predefined scale factors, such as meters to feet, as well as user defined custom scale factors. Coordinates, (x,y,z) can be scaled individually.
- Create Entity has been improved to include:
  - Create the next point or point included in linework based on slope
  - Support right mouse button menu option Select by bounded Area
- Previous Selection has been improved to reselect all data included in the last selection set. This option is in the Right Mouse Button context menu and the Edit ribbon.
- 3D View has been improved by adding new options.
  - New 3D Tab has been renamed to 3D View. By default, the 3D view opens as a vertical tab. This tab can be added to the Survey tab to go to a maximized view or can be placed on an additional monitor.
  - A new option 2D/3D Split has been added. This option splits the main view into two areas, the left side is 2D the right side is 3D. The size of the areas can be adjusted by dragging the borders to the desired size. Each area has its own functionality set which is accessed from the various accessible ribbons in each area.  
The 2D/3D Split icon acts a toggle to access the view and to close the view.
  - 3D Toggle has been removed

- 3D project views now close when the project is closed.
- Lot Annotation and Report has been improved to include the optional label of the perimeter distance in the survey view as well as the lot report.
- Inquire Area has been updated to better support area calculations of areas bounded by objects without points.
- Create Plot Window has added a "Total Sheets" input field for plotting multiple sheets. When the "Apply" option is toggled on the field will read the total number of sheets based on the number of sheets created. The field allows for manual edit of the total sheet number when required.
- Extract Drawing is a new option to create a polygon from a plot window (drawing). Plot windows must be displayed using the "Show" option from the Plot Window ribbon group. The option is available in the right mouse button menu when the cursor is located within the Plot window (Drawing) limits.
- Drawing View – added a "color" setting in the North Arrow dialog.
- Selectby has been updated to include the option to select data by Layer Groups.
- Edit Points
  - Added support for manually renaming individual point names/numbers.
  - Added message when there are no results generated based on selected search filters.
- Quick Profile
  - Improved to highlight the profile reference line in the Survey view.
  - Added Text Style settings in the display settings to allow size/font to be configured for the DTM name

## DTM (Surface) Functionality

## New Features and Improvements

- Planes – Added functionality to create, edit, display and delete Planes for use in 3DMC and Magnet Field.
  - Planes are displayed in the Survey (CAD) view based on the defined grid settings, specified surface point and defined orientation.

- Merge DTMs – improved the speed of merging large dtms.
- Create Cut/Fill DTM
  - Updated to optionally include a color fill legend as the last step of the dtm creation. The outline of the legend is displayed for positioning in the drawing. To not insert the legend, press the escape key when the outline is displayed.
  - Cut/Fill dtms, when created, will be set to the current dtm for quick inspection of depths in the information toolbar.
  - Added optional compaction coefficient, labeled “Diff Compaction for Fill”. This results in a CF dtm that reflects the depth required to meet a compaction requirement. For example, a 1-foot layer of asphalt with a 10% compaction coefficient would require 1.10’ of depth.
- Insert Legend is a new option located in the DTM Tools dropdown menu. This option inserts a dtm color fill or slope fill/arrow legend in the survey and drawing views. Multiple legends can be inserted for showing color fill shading for multiple dtms individually. Legends can be selected and repositioned at any time. Functionality is supported in Drawing view as well.
- Edit Contour Label is a new option in the Surface ribbon. This allows for manually positioning new contour labels and editing the position of existing labels. Contour labels option in the DTM settings must be on.
- Slope Zone Report – A new optional slope report has been added to the dtm report function. When slope arrows or slope shading is on generating a dtm report will include a report of the slope ranges and their corresponding area.
- Simplify DTM, located in the DTM Tools dropdown, is a new option to simplify a specified DTM. Simplification of the DTM can be accomplished using one of two options, Edge Contraction or Point Reduction. The selected DTM can be updated or a new DTM created by the simplification. This option is useful for reducing the size of a dtm.



- DTM Manager
  - New controls for triangle display in the 3D and 2D/3D Split views have added in the “3D View Display” DTM Manger dialog group.
    - Solid – shows triangular mesh as a solid color. Color is defined by the mesh color. This option is the default setting
    - Mesh – shows the mesh only
    - Solid + Mesh – shows mesh and solid
    - Settings are applied and retained per DTM
- DTM Tools
  - Export DTM has been updated to include the option to export a dtm as a Trimble Tin Model (\*.ttm) file.
- DTM Editor - A new modeless DTM Editor UI has been implemented and is accessed from the DTM Ribbon, Create/Edit DTM ribbon group. This UI can always remain open and allows access to other functionality while open. DTM modifications are immediately reflected in the contour configuration and color fill shading if present. The following list of commands have been either moved to or replaced by the new DTM Editor.

#### Moved

- Delete Triangle
- Delete by Line
- Delete by boundary
- Delete by Length or Angle
- Add Triangle
- Swap Triangles
- Decompose Triangle

#### Replaced

- Modify DTM

#### DTM Editor New Functionality

The DTM Editor is made up of four tabs, Delete Triangles, Add Triangles, Surface Data, and Surface Points.

- Pick is a new option that allows the selection of the dtm to edit by simply picking within the boundary of a dtm. To use select the Pick button and pick inside a dtm boundary. This option is also good for identifying dtms when multiple dtms are present. When picked the dtm will briefly shade indicating the dtm selected.
- Highlight is a new option that briefly highlights a dtm specified in the DTM Editor. This is used to confirm the correct selection of the dtm to edit.
- Selection of Triangles for deletion - Triangle deletion can now be accomplished by using selection windows or crossing windows as well as the single pick inside of a triangle.
- Confirm on Delete is now an option, when off deletion is immediate.
- Re-Triangulate on Delete – this option will retriangulate areas where triangles have been deleted during the deletion process. It is also available when Deleting Data or Removing Surface points.
- Fill Gaps is a new option to fill in areas of no triangles quickly. An area to fill can be identified by a single pick with the area or multiple areas can be identified by forming a window around all the areas or by windowing in the entire dtm.
- Add Data is a new option to add within or outside of a dtm boundary. When an object is selected, such as a string, line or polygon, the points linked to the object are selected and the breakline setting for the object is used.
- Add Data within Window is a new option that allows data to be selected by a window selection and add it to the dtm being modified. Triangles created are only within the window formed. This allows for quickly combining multiple dtms into one dtm.
- Delete by Data allows for the deletion of data from a dtm by selecting objects with linked points or points only.
- Edit Surface Point Elevation allows for modifying the elevation of any surface point contained in the dtm. An option is provided to update the linked point if applicable.
- Create Surface Point allows the creation of a surface point within or outside the dtm boundary. When picking inside the boundary the interpolated elevation of the surface point will display in the dialog. This value can be edited another value. If picking outside the dtm boundary the average elevation of the dtm will be displayed in the dialog. This value can be set to the desired elevation. Note that surface points are not named points and not stored in the point database. If the surface points are required for use in the survey view us the Create Points from DTM option to write them to points database.

- Remove Surface Points allows for removing surface data points from a dtm. Points can be removed individually, or multiple points can be removed using a window selection. The option to Retriangulate on Delete is available for use with this option.
- Undo/Redo is now supported for the delete/add triangles options as well as data additions/deletions or surface point elevation modifications.

## Pad Design

- Multi Pads is a new pad design function. This allows for the design of multiple pads at the same time. Specify a reference surface and the design constraints for each pad such as elevation and side slopes (batters).
  - Side slope layer selection
  - Option to add the side slope layer to the Design layer group for takeoff calculations.
  - Option to create Pads dtm (new dtm created by merging the reference and pads dtm) or create a pad only dtm by using the Trim to Side Slopes option.
  - Located in the Design Ribbon.

## Corridor/Road View Functionality

- Cross Section Lines is a new option located in the Design ribbon, Cross section group. This allows for the permanent display of section line locations defined in a corridor, road or any design function requiring cross sections and an alignment. Settings for the section lines and labels are provided in the Cross-Section Line dialog. (Survey, Site, Construction, Project)
- Corridor & Cross Section Set - Grade Sheet Report (Site, Construction, Project)
  - Updated to support cross section sets in addition to corridors.
  - Updated to include landscape setting for the report
- Corridor Cross Section Viewer has been revised to display/hide cross slopes for any surface selected for use in the cross section set. This option is in the graphic view Settings dialog. (Site, Construction, Project)
- Corridor Vertical Alignment Editor now includes:
  - Option to Raise/Lower IP by station range.

- Option to pick IP elevation by picking an existing point in the survey view or by picking a location and interpolating the elevation based on the dtm set as current in the project.
- Now allows for selection of data in read only fields for use with copy/paste functions.
- Added support for vertical alignment plotting. Basic plot settings displayed by default but can be expanded to advanced settings.
- Corridor Template, Cross Section View, and Corridor Zone Widths/Slopes Editors have been updated to support Station Equation stationing when using the slider bar. (Site, Construction, Project)
- Road View, Profile/Long Section functionality has been updated to include the option to compute VC's based on station/chainage range. (Survey, Site, Construction, Project)
- Road View, Cross Section Plot
  - Added new options when including service strings in cross section plots to include labels for Offset, Elevation and/or Depth of service strings.
- Horizontal Alignment curve information has been improved to update terminology and display in larger text. (Survey, Site, Construction, Project)

## Resurface Functionality

## New Features and Improvements

- Resurface Design now supports IRI (International Roughness Index) calculations from the longitudinal profiles of the design. IRI reports and graphs have been added. (Construction, Project)
- Surface Ribbon > Create Cut/Fill DTM - Updated to add optional compaction coefficient, labeled "Diff Compaction for Fill". This results in a CF dtm that reflects the depth required to meet a compaction requirement. For example, a 1-foot layer of asphalt with a 10% compaction coefficient would require 1.10' of depth. (Survey, Site, Construction, Project)
- Alignment Window has been updated to include new options listed below. (Construction, Project)
  - Select Station Range. This is a new option that allows for the selection of the area of work, start and end marks, by forming a window around the desire area in

the alignment window. The option can be accessed by the following methods:

- Right mouse button menu
- Keyboard shortcut of CTRL+R
- Alignment Ribbon, alignment ribbon group
- Quick Display Toggle for
  - Fill/Milling area
  - Paving Thickness
  - Milling Depth Stations
  - IRI values
- Cross Section Window has been updated to include new options listed below.
  - Quick Display Toggle for :
    - Fill
    - Cut
    - Depth
    - Design Elev
    - Natural Elev
- Profile Window
  - Quick Display toggle for :
    - IP Comments
    - IRI Values
- Profile IP Comments have been improved to include a Large and Normal setting for the comment text. In addition, the labels can now be positioned either horizontally or vertically. The comment position setting is located on the Resurface Settings tab as a dropdown beside the comment label toggle.
- Profile IP Details – added a new field “Adjust Level Increment”. This allows for entry of an incremental adjustment value for modification of the IP Level. The Up/Down arrows located beside the field is used to adjust the level up or down.
- Station Equations – All applicable resurface design dialogs have been updated to support station equations.
- Insert Ortho Photos (Background Images)

- Updated to include the ability to set the units for the importing images. By default, the unit is set to meters which is typically the units used in geo-referenced images.
- Batch insertion of geo-referenced images, multiple images, has been revised to display the insertion dialog so that the transparency of the images can be defined on import.
- Background Image Transparency setting has been improved to support multiple image transparency modification.
- Exclusion Areas have been added to the Resurface design view. Exclusion areas are not included in the area and volume calculations of the resurface design.
- Exclusion areas are shown in each design window of the Resurface design view.
  - Add Exclusion area – identifies an area for exclusion
    - By String – requires selection of a reference string and an exclusion string.
    - By Offsets – requires selection of a reference string, From Station and End Station, Start and End offsets and sides for offsets.
  - Delete Exclusion area – use to delete defined exclusion areas.
  - Reporting – Exclusion areas are included in the “Summary Report” section of the Resurface Report.
- Improved performance for saving and opening resurface projects.

## Takeoff Functionality

- Mass Haul Analysis has been updated to support the transfer of the following data from Magnet Office to Project (mass haul/scheduling functionality)
  - All Takeoff types are now included in the transfer to the mass haul/scheduling functionality of Magnet Project. These include Count, Length, Area and Volume types.
  - Job data displayed in the Survey view of Magnet Office is now transferred to Magnet Project as a background image. The background image is displayed in the Map view of the mass haul/scheduling (Project) functionality.
- Settings – when performing a specific design element takeoff, such as a road, trench or corridor, site boundary selection is no longer required. Site boundaries are required with a total site takeoff including various design elements.

- Takeoff Ribbon has been updated to separate takeoff preparation into Site and Design Element takeoff calculations. The settings dialog has been updated to include settings to support layer group takeoff, surface takeoff, and material only takeoffs with options to include Strata data from borehole input and/or surfaces representing strata.
- Trench Design has been revised to include a new design logic and UI for creating pipe trenches.
  - Basic and Advanced design modes.
    - Basic mode support single pipes only and trench depth, width, over excavate depth, backfill materials and tie slopes to original ground.
    - Advance mode supports all the basic design functions and additionally
      - multiple pipes with horizontal and vertical offsets from centerline of trench.
      - Additional trench template instructions for benching and complex trench design.
  - Horizontal and vertical alignments are now supported
  - Trenches can now be defined as a depth from the existing surface or defined by a vertical alignment.
  - Supports multiple pipes
  - Supports benching within trench (advanced mode)
  - Digitize Trench Profile is a new option to quickly create trench profiles (vertical alignments) using the horizontal and vertical profile grids contained in pdf and dwg files containing trench designs.
  - Trench templates can now be created and added to the Trench Template library for repeated use.
  - Additional options for trenching
    - Quantity report
    - Depth Zones
    - Depth Report
    - Depth Plot

## Modeler/Explorer Functionality

As Magnet Office works to integrate new technologies and features, the importance of creating

feature sets shared across Magnet Office products is critical. For this reason, Magnet Explorer and Modeler applications have been combined into a new single user interface with improved functionality.

The new interface provides tools to easily and quickly assign 3D elements to layers to create a 3D visualization of the data.

## Improvements

- Magnet Office Modeler ribbon icons
  - Create New – creates new 3D Model
  - Open – opens an existing Modeler 3D Model (\*.mjm) file
  - Update – updates the corresponding 3D Model created from Magnet Office with any changes or additions made in office.
- New 3D graphics engine
- New high-quality textures and 3D objects
- Templates are used to manage Styles, Materials and Object elements which are required for 3D Modeler creation.
- Styles, Materials and Objects each provide options to create new specific user defined elements.
- In addition to the Materials, Objects and textures provided, additional user defined or purchased Materials, Objects and textures can be used.
- Layer rules are provided for grouping of layers to a specific model element. A powerful wildcard matching function can be used to easily group layers.
- A new 3D Graphic engine is included which support high resolution images and complex 3D objects. The visualization quality of the model has been greatly improved.
- A new three section interface is provided. This includes a command and definition panel on the left, a 2D view (center) and a 3D view (Right).
- The 2D view includes a 3D view toggle in order to view, rotate and pan the CAD data in 3D.
- The 2D and 3D views can be synchronized for viewing by toggling on the synchronization option located at the bottom of the 2D/3D window area.
- A layer list is provided in the definition panel. Layers selected in the list will be highlighted in the 2D view. Objects selected in the 2D/3D view will highlight the



corresponding layer in the list.

- Layers from the 2D view can be added to the 3D view using the Add Layer option in the 3D Layer panel in the 3D view.
- Modeler UI - Import, "Update 2D Drawing" supports various file types for import. These include:
  - Autodesk drawing (\*.dwg)
  - Bentley Microstation (\*.dgn)
  - Topcon formats:
    - Magnet Field, Magnet Tools, Magnet Office (\*.mxi)
    - Magnet Office job (\*.mjo)
    - 3DMC project (\*.TP3)
- New Magnet Model file extension \*.mjm is created when saving the model.
- Modeler UI - 3D View Controls
  - Auto Regeneration on/off toggle
  - Re-generate model toggle
  - 3D Layer Panel
  - Home button to reset the camera position

### Workflow Example

- Create magnet office mjo, containing linework, points, surfaces etc.
- From the Modeler ribbon select Create New. It is recommended to use one of the existing templates provided in lieu of starting from scratch. Existing templates include defined styles, materials and objects which make it easier to create a personal user template.
- Within the Modeler interface, either assign layer rules or simply assign styles to specific layers.
- The 3D window updates immediately with the selected style.
- Save the model and/or publish to Magnet Live for collaboration exercises.

- 3D View Controls
  - Auto Regeneration on/off toggle
  - Re-generate model toggle
  - 3D Layer Panel
  - Home button to reset the camera position
- Import, "Update 2D Drawing" supports various file types for import. These include:
  - Autodesk drawing (\*.dwg)
  - Bentley Microstation (\*.dgn)
  - Topcon formats:
    - Magnet Field, Magnet Tools, Magnet Office (\*.mxi)
    - Magnet Office job (\*.mjo)
    - 3DMC project (\*.TP3)
- Magnet Model file extension \*.mjm is created when saving the model.

## Magnet Tools

### General

- Installation of the Civil 3D MAGNET ribbon is now optional during installation.
- Added support of Planes
  - Show and edit in the tabular view.
  - Import/Export by MJF, MaXML, PL3 and TP3.
- Added support for Magnet Field Custom Symbols
- Improved data entry UI in Manual TS Data
  - Allows for data entry in grid of tabular view
  - Properties button added to all manual data entry dialogs
  - Added automatic point number advancement to manual TS data entry dialog
- Enterprise ribbon
  - Removed Chat, Schedule/Timecard functionality
  - Removed News icon

- Check IN/OUT functionality has been improved to revise the license validation logic. The validation check is now determined by the activation process. To enable the Check In/Out functionality the license must be activated using the “Online” method. The “online” method is completed using the in-application activation workflow. “Offline” activation is completed by accessing the Magnet Enterprise or Topcon Positioning website for activation. Product Activation is accessed from the vertical Apps bar located on the left side of the webpage. Once signed into the website options available to the user will appear in this vertical app bar.

This workflow requires entry of the device id for the device the software is installed on as well as entry of an authorization code generated and displayed during the offline activation workflow.

Note: Check In/out functionality is not available when using the following activation methods or license types.

- Offline activation
  - Perpetual license
  - Subscription license
- Activation to a USB key
  - Perpetual license
  - Subscription license
- Educational licenses
- Perpetual with expired Service Plan
- Trial licenses

## Coordinate Systems

- Additional settings for datums such as NAD27, NAD27(CSRS) and NAD83(CSRS) are now centrally located in the Settings dialog accessed from the Job Configuration UI.
- Added optional display of Ellipsoidal height together with Elevation in the Points tabular view.
- Added “Datum (Xc/Yc/Zc to the Tabular view for display of any datum XYZ coordinates.
- Added Support of equidistance cylindrical projections for maps.
- Added Egyptian projections.
- Updated Singapore geoid SGEOID09
- Added Estonian geoid EST-GEOID2017
- Added Spain datum NTV2SPAIN

## User Interface

- Added Tooltips to tabular view headers for full name viewing
- Standardized Ephemeris header titles
- Updated term GPS to GNSS in tabular view and applicable views.

## Import/Export

- Added support for transferring text labels to AutoCAD dwg files.
- Updated export custom format to support adding label for undefined coordinate. When defining a custom format, the option Use Coordinate Placeholder option allows for entering a label for the placeholder.
- Added import/export support for Geocomp files.

## Adjustment

- The Process ribbon has been updated to include two new icons, Adjustment by Least Squares and TS-Traverse Adjustment by Compass Rule. The setting for default adjustment type has been removed from the Configuration dialog.
- Added normalized residuals to the rejection criterion options in the Process Properties of Least Squares adjustment. The following residual types are available:
  - X Y Z
  - N E U
  - Distance Angle Elevation
- Updated Blunder Treatment options to include “Automatic Blunder Reweighting”.
- GPS Loop Closure user interface has been improved.

## Reports

- New table format templates are provided which allows for table and cell formatting. The following reports were replaced with this new format.
  - Localization
  - Field Report
  - Adjustment
  - Project
- Added Import/Export support for reports. This allows for transfer of report formats to and from other computers running Magnet Tools.
- GNSS Observation report; added new fields relating to precision and adjustment.

- Error circles and error ellipses
- Normalized residual (Standardized residual)
- From point code and To point code columns
- Vertical error and selected confidence level
- Time only field (Start Time)
- GPOD values
- TS Observation report new fields for reporting
  - Added option to report x,y,z of target point
  - Normalized residual (Standardized residual)
- Point report new fields for reporting
  - Error ellipses
  - Circular probable error with selected confidence level
- Field reports
  - Added support for multiple images

## Miscellaneous

- Added filtering of Import from Internet results
- Added Vienna Mapping functions for post processing.
- Added ability to display vector length for non-processed vectors
- GPS Observations improved to support selection of vectors by length and adjacent angles for network selection to be post processed.
- GNSS (GPS) View disable/enable occupations has been improved
  - Part of an occupation can be disabled/enabled by right click on the occupation and selecting disable or enable "SV's in epochs: ??"
  - Optionally the entire occupation can be disabled/enabled by selecting "Enable or Disable SV's: ??"

## Magnet Tools ribbon in AutoCAD and Magnet Exchange for Autodesk

- Support of Civil 3D 2013 and 2014 has been remove and no longer supported.

## MAGNET Site - V7.0

### General

### Magnet Site V7 Release Notes:

The following new additions/revisions have been made to Magnet Site V7.0 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

Processor Speed

2GHz Core2 processor or higher

RAM

2GB RAM or more recommended

Memory

Local hard drive space of 2GB or higher recommended

Computer Resolution

1280x1024 display resolution

Internet Connectivity

Can be required by some functionality.

### General Functionality

#### New Features and Improvements

- Check IN/OUT functionality has been improved to revise the license validation logic. The validation check is now determined by the activation process. To enable the Check In/Out functionality the license must be activated using the "Online" method. The "online" method is completed using the in-application activation workflow.

“Offline” activation is completed by accessing the Magnet Enterprise or Topcon Positioning website for activation. Product Activation is accessed from the vertical Apps bar located on the left side of the webpage. Once signed into the website options available to the user will appear in this vertical app bar. This workflow requires entry of the device id for the device the software is installed on as well as entry of an authorization code generated and displayed during the offline activation workflow. Note: Check In/out functionality is not available when using the following activation methods or license types.

- Offline activation
    - Perpetual license
    - Subscription license
  - Activation to a USB key
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  - Educational licenses
  - Perpetual with expired Service Plan
  - Trial licenses
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- Performance - Improved and optimized various areas of the program for efficiency including opening, Import/Export, Data Clean up, DTM functions, large jobs etc.
  - Object Selection has been updated to support holding the CTRL key and dragging a window around data to be removed from a selection.
  - Modeless Panels can now be collapsed if undocked by clicking on the top left corner of dialog.
  - Select Path by Bounded Area is a new option accessed from the right mouse button menu. This option allows the creation of a closed object, string, polygon, boundary, lot, pad by picking inside a bounded area. The bounded area can be enclosed by multiple objects. The routine will highlight the determined area and prompt for confirmation.
  - Asset Design as Constructed (ADAC) export support has been added to the Survey ribbon. The functionality for preparation of the ADAC.XML file is accessed via the ADAC Data Manager. Once the project data is defined and categorized based on ADAC guidelines an export option is available for creation of the ADAC.xml file for submittal.
  - Import/Export
    - Added Import/Export support for Lidar point cloud LAS files (\*.las, \*.laz).
    - Added Export to SurPac string format (\*.str)
    - Added Import/Export of KMZ and Export of KML files.
    - Added Import of Japanese XML format



- DWG format
  - Updated to include option to export metric jobs to millimeters.
  - Updated to include “tadpole” arrows for side slope (batters) indicators
  - Import linetypes supported
  - Export improved to support export of point elevations with Use in Surface ON. Elevations of point with Use in Surface off are exported with elevation 0.
- MJF Import/Export has been updated to support Magnet Field custom symbols.
- Cloud Connections
  - Added support for connecting to Sitelink 3D V1 and V2 Sites from the Cloud Connections ribbon, Sitelink 3D ribbon group.
- Modeless Properties UI - The properties toolbar has been updated to a modeless user interface. This UI can be opened and used as a docked panel with autohide capability or a floating panel. All object property modification is done from this UI. The new Properties panel replaces the Edit Group Properties and the individual entity properties dialog accessed by double clicking on an entity.

When a layer is selected as the current layer, the properties are set to “bylayer” by default. This is a change from the legacy logic of properties defined by entity and is consistent with typical CAD programs. The ability to set properties by entity has been retained.

  - Object limit for Properties Manager is a new setting added to the Program Settings, Preferences tab. The recommended and default value for this setting is 25,000; the maximum setting is 30,000. When the specified limit is met, the properties UI will list “varies” for each object property. This does not prevent the changing of properties for selections over the specified limit only the listing of the individual property settings.
- Selection Cycling is a new option located in the Program Settings, Preferences tab and the Settings ribbon for quickly turning on and off. By default, this setting is on. When ON, selecting objects that are overlaying other objects or points which are near other points, a dialog is displayed listing the objects available for cycling. To select the data to work with, select it from the list. When multiple points are listed in the cycle list, the keyboard arrows can be used to browse the listed points. The selected point is highlighted during browsing the points.
- Create Entity has been improved to include
  - Create the next point or point included in linework based on slope

- Support right mouse button menu option Select by bounded Area
- Previous Selection has been improved to reselect all data included in the last selection set. This option is in the Right Mouse Button context menu and the Edit ribbon.
- 3D View has been improved by adding new options.
  - New 3D Tab has been renamed to 3D View. By default, the 3D view opens as a vertical tab. This tab can be added to the Survey tab to go to a maximized view or can be placed on an additional monitor.
  - A new option 2D/3D Split has been added. This option splits the main view into two areas, the left side is 2D the right side is 3D. The size of the areas can be adjusted by dragging the borders to the desired size. Each area has its own functionality set which is accessed from the various accessible ribbons in each area.

The 2D/3D Split icon acts a toggle to access the view and to close the view.
  - 3D Toggle has been removed
  - 3D project views now close when the project is closed.
- Lot Annotation and Report has been improved to include the optional label of the perimeter distance in the survey view as well as the lot report.
- Inquire Area has been updated to better support area calculations of areas bounded by objects without points.
- Create Plot Window has added a "Total Sheets" input field for plotting multiple sheets. When the "Apply" option is toggled on the field will read the total number of sheets based on the number of sheets created. The field allows for manual edit of the total sheet number when required.
- Extract Drawing is a new option to create a polygon from a plot window (drawing). Plot windows must be displayed using the "Show" option from the Plot Window ribbon group. The option is available in the right mouse button menu when the cursor is located within the Plot window (Drawing) limits.
- Drawing View – added a "color" setting in the North Arrow dialog.
- Selectby has been updated to include the option to select data by Layer Groups
- Edit Points
  - Added support for manually renaming individual point names/numbers.
  - Added message when there are no results generated based on selected search filters.
- Quick Profile

- Improved to highlight the profile reference line in the Survey view.
- Added Text Style settings in the display settings to allow size/font to be configured for the DTM name

## DTM (Surface) Functionality

### New Features and Improvements

- Planes – Added functionality to create, edit, display and delete Planes for use in 3DMC and Magnet Field.
  - Plans are displayed in the Survey (CAD) view based on the defined grid settings, specified surface point and defined orientation.
- Merge DTMs – improved the speed of merging large dtms.
- Create Cut/Fill DTM
  - Updated to optionally include a color fill legend as the last step of the dtm creation. The outline of the legend is displayed for positioning in the drawing. To not insert the legend, press the escape key when the outline is displayed.
  - Cut/Fill dtms, when created, will be set to the current dtm for quick inspection of depths in the information toolbar.
  - Added optional compaction coefficient, labeled “Diff Compaction for Fill”. This results in a CF dtm that reflects the depth required to meet a compaction requirement. For example, a 1-foot layer of asphalt with a 10% compaction coefficient would require 1.10' of depth.
- Insert Legend is a new option located in the DTM Tools dropdown menu. This option inserts a dtm color fill or slope fill/arrow legend in the survey and drawing views. Multiple legends can be inserted for showing color fill shading for multiple dtms individually. Legends can be selected and repositioned at any time. Functionality is supported in Drawing view as well.
- Edit Contour Label is a new option in the Surface ribbon. This allows for manually positioning new contour labels and editing the position of existing labels. Contour labels option in the DTM settings must be on.
- Slope Zone Report – A new optional slope report has been added to the dtm report function. When slope arrows or slope shading is on generating a dtm report will include a report of the slope ranges and their corresponding area.
- Simplify DTM, located in the DTM Tools dropdown, is a new option to simplify a

specified DTM. Simplification of the DTM can be accomplished using one of two options, Edge Contraction or Point Reduction. The selected DTM can be updated or a new DTM created by the simplification. This option is useful for reducing the size of a dtm

- DTM Manager
  - New controls for triangle display in the 3D and 2D/3D Split views have added in the “3D View Display” DTM Manger dialog group.
    - Solid – shows triangular mesh as a solid color. Color is defined by the mesh color. This option is the default setting
    - Mesh – shows the mesh only
    - Solid + Mesh – shows mesh and solid
    - Settings are applied and retained per DTM
- DTM Tools
  - Export DTM has been updated to include the option to export a dtm as a Trimble Tin Model (\*.ttm) file.
- Merge DTM performance has been improved to speed up the process of merging large dtms.
- DTM Editor - A new modeless DTM Editor UI has been implemented and is accessed from the DTM Ribbon, Create/Edit DTM ribbon group. This UI can always remain open and allows access to other functionality while open. DTM modifications are immediately reflected in the contour configuration and color fill shading if present. The following list of commands have been either moved to or replaced by the new DTM Editor.

#### Moved

- Delete Triangle
- Delete by Line
- Delete by boundary
- Delete by Length or Angle
- Add Triangle
- Swap Triangles
- Decompose Triangle

#### Replaced

- Modify DTM

## DTM Editor New Functionality

The DTM Editor is made up of four tabs, Delete Triangles, Add Triangles, Surface Data, and Surface Points.

- Pick is a new option that allows the selection of the dtm to edit by simply picking within the boundary of a dtm. To use select the Pick button and pick inside a dtm boundary. This option is also good for identifying dtms when multiple dtms are present. When picked the dtm will briefly shade indicating the dtm selected.
- Highlight is a new option that briefly highlights a dtm specified in the DTM Editor. This is used to confirm the correct selection of the dtm to edit.
- Selection of Triangles for deletion - Triangle deletion can now be accomplished by using selection windows or crossing windows as well as the single pick inside of a triangle.
- Confirm on Delete is now an option, when off deletion is immediate.
- Re-Triangulate on Delete – this option will retriangulate areas where triangles have been deleted during the deletion process. It is also available when Deleting Data or Removing Surface points.
- Fill Gaps is a new option to fill in areas of no triangles quickly. An area to fill can be identified by a single pick with the area or multiple areas can be identified by forming a window around all the areas or by windowing in the entire dtm.
- Add Data is a new option to add within or outside of a dtm boundary. When an object is selected, such as a string, line or polygon, the points linked to the object are selected and the breakline setting for the object is used.
- Add Data within Window is a new option that allows data to be selected by a window selection and add it to the dtm being modified. Triangles created are only within the window formed. This allows for quickly combining multiple dtms into one dtm.
- Delete by Data allows for the deletion of data from a dtm by selecting objects with linked points or points only.
- Edit Surface Point Elevation allows for modifying the elevation of any surface point contained in the dtm. An option is provided to update the linked point if applicable.
- Create Surface Point allows the creation of a surface point within or outside the dtm boundary. When picking inside the boundary the interpolated elevation of the surface point will display in the dialog. This value can be edited another value. If picking outside the dtm boundary the average elevation of the dtm will be displayed in the dialog. This value can be set to the desired elevation. Note that

surface points are not named points and not stored in the point database. If the surface points are required for use in the survey view use the Create Points from DTM option to write them to points database.

- Remove Surface Points allows for removing surface data points from a dtm. Points can be removed individually, or multiple points can be removed using a window selection. The option to Retriangulate on Delete is available for use with this option.
- Undo/Redo is now supported for the delete/add triangles options as well as data additions/deletions or surface point elevation modifications.

## Pad Design

- Multi Pads is a new pad design function. This allows for the design of multiple pads at the same time. Specify a reference surface and the design constraints for each pad such as elevation and side slopes (batters).
  - Side slope layer selection
  - Option to add the side slope layer to the Design layer group for takeoff calculations.
  - Option to create Pads dtm (new dtm created by merging the reference and pads dtm) or create a pad only dtm by using the Trim to Side Slopes option.
  - Located in the Design Ribbon.

## Corridor/Road View Functionality

- Cross Section Lines is a new option located in the Design ribbon, Cross section group. This allows for the permanent display of section line locations defined in a corridor, road or any design function requiring cross sections and an alignment. Settings for the section lines and labels are provided in the Cross-Section Line dialog.
- Corridor & Cross Section Set - Grade Sheet Report
  - Updated to support cross section sets in addition to corridors.
  - Updated to include landscape setting for the report
- Corridor Cross Section Viewer has been revised to display/hide cross slopes for any surface selected for use in the cross section set. This option is in the graphic view Settings dialog.
- Corridor Vertical Alignment Editor now includes:

- Option to Raise/Lower IP by station range.
- Option to pick IP elevation by picking an existing point in the survey view or by picking a location and interpolating the elevation based on the dtm set as current in the project.
- Now allows for selection of data in read only fields for use with copy/paste functions.
- Added support for vertical alignment plotting. Basic plot settings displayed by default but can be expanded to advanced settings.
- Corridor Template, Cross Section View, and Corridor Zone Widths/Slopes Editors have been updated to support Station Equation stationing when using the slider bar.
- Road View, Profile/Long Section functionality has been updated to include the option to compute VC's based on station/chainage range.
- Road View, Cross Section Plot
  - Added new options when including service strings in cross section plots to include labels for Offset, Elevation and/or Depth of service strings.
- Horizontal Alignment curve information has been improved to update terminology and display in larger text.

## Modeler/Explorer Functionality

As Magnet Office works to integrate new technologies and features, the importance of creating feature sets shared across Magnet Office products is critical. For this reason Magnet Explorer and Modeler applications have been combined into a new single user interface with improved functionality.

The new interface provides tools to easily and quickly assign 3D elements to layers to create a 3D visualization of the data.

## Improvements

- Magnet Office Modeler ribbon icons
  - Create New – creates new 3D Model
  - Open – opens an existing Modeler 3D Model (\*.mjm) file

- Update – updates the corresponding 3D Model created from Magnet Office with any changes or additions made in office.
- New Magnet Model file extension \*.mjm is created when saving the model.
- Templates are now used to manage Styles, Materials and Object elements which are required for 3D Modeler creation.
- Styles, Materials and Objects each provide options to create new specific user defined elements.
- In addition to the Materials, Objects and textures provided, additional user defined or purchased Materials, Objects and textures can be used.
- Layer rules are provided for grouping of layers to a specific model element. A powerful wildcard matching function can be used to easily group layers.
- A new 3D Graphic engine is included which support high resolution images and complex 3D objects. The visualization quality of the model has been greatly improved.
- A new three section interface is provided. This includes a command and definition panel on the left, a 2D view (center) and a 3D view (Right).
- The 2D view includes a 3D view toggle in order to view, rotate and pan the CAD data in 3D.
- The 2D and 3D views can be synchronized for viewing by toggling on the synchronization option located at the bottom of the 2D/3D window area.
- A layer list is provided in the definition panel. Layers selected in the list will be highlighted in the 2D view. Objects selected in the 2D/3D view will highlight the corresponding layer in the list.
- Layers from the 2D view can be added to the 3D view using the Add Layer option in the 3D Layer panel in the 3D view.
- Modeler UI - Import, "Update 2D Drawing" supports various file types for import. These include:
  - Autodesk drawing (\*.dwg)
  - Bentley Microstation (\*.dgn)
  - Topcon formats:
    - Magnet Field, Magnet Tools, Magnet Office (\*.mxl)
    - Magnet Office job (\*.mjo)
    - 3DMC project (\*.TP3)



- Modeler UI - 3D View Controls
  - Auto Regeneration on/off toggle
  - Re-generate model toggle
  - 3D Layer Panel
  - Home button to reset the camera position

#### Workflow Example:

- Create magnet office mjo, containing linework, points, surfaces etc.
- From the Modeler ribbon select Create New. It is recommended to use one of the existing templates provided in lieu of starting from scratch. Existing templates include defined styles, materials and objects which make it easier to create a personal user template.
- Within the Modeler interface, either assign layer rules or simply assign styles to specific layers.
- The 3D window updates immediately with the selected style.
- Save the model and/or publish to Magnet Live for collaboration.

## Magnet Tools

### General Improvements

- Installation of the Civil 3D MAGNET ribbon is now optional during installation.
- Added support of Planes
  - Show and edit in the tabular view.
  - Import/Export by MJF, MaXML, PL3 and TP3.
- Added support for Magnet Field Custom Symbols
- Improved data entry UI in Manual TS Data
  - Allows for data entry in grid of tabular view
  - Properties button added to all manual data entry dialogs
  - Added automatic point number advancement to manual TS data entry dialog
- Enterprise ribbon
  - Removed Chat, Schedule/Timecard functionality
  - Removed News icon
- Check IN/OUT functionality has been improved to revise the license validation logic. The validation check is now determined by the activation process. To enable the Check

In/Out functionality the license must be activated using the “Online” method. The “online” method is completed using the in-application activation workflow. “Offline” activation is completed by accessing the Magnet Enterprise or Topcon Positioning website for activation. Product Activation is accessed from the vertical Apps bar located on the left side of the webpage. Once signed into the website options available to the user will appear in this vertical app bar.

This workflow requires entry of the device id for the device the software is installed on as well as entry of an authorization code generated and displayed during the offline activation workflow.

Note: Check In/out functionality is not available when using the following activation methods or license types.

- Offline activation
  - Perpetual license
  - Subscription license
- Activation to a USB key
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## Coordinate Systems

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## MAGNET Survey V7.0

### General

## Magnet Survey V7 Release Notes

The following new additions/revisions have been made to Magnet Survey v7.0 products.

Please take time to read the release notes. They contain information about the following:

- New Features
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- Bug Fixes

### System Requirements:

Operating System

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Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

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Memory

Local hard drive space of 2GB or higher recommended

Computer Resolution

1280x1024 display resolution

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  - Trial licenses
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  - Modeless Panels can now be collapsed if undocked by clicking on the top left corner of dialog.
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    - Added Import/Export support for Lidar point cloud LAS files (\*.las, \*.laz).
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    - Added Import/Export of KMZ and Export of KML files.

- Added Import of Japanese XML format.
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  - Updated to included option to export metric jobs to millimeters.
  - Updated to include “tadpole” arrows for side slope (batters) indicators
  - Import linetypes supported
  - Export improved to support export of point elevations with Use in Surface ON. Elevations of point with Use in Surface off are exported with elevation 0.
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- Selection Cycling is a new option located in the Program Settings, Preferences tab and the Settings ribbon for quickly turning on and off. By default, this setting is on. When ON, selecting objects that are overlaying other objects or points which are near other points, a dialog is displayed listing the objects available for cycling. To select the data to work with, select it from the list. When multiple points are listed in the cycle list, the keyboard arrows can be used to browse the listed points. The selected point is highlighted during browsing the points.
- Create Entity has been improved to include
  - Create the next point or point included in linework based on slope
  - Support right mouse button menu option Select by bounded Area
- Previous Selection has been improved to reselect all data included in the last selection



set. This option is in the Right Mouse Button context menu and the Edit ribbon.

- 3D View has been improved by adding new options.
  - New 3D Tab has been renamed to 3D View. By default, the 3D view opens as a vertical tab. This tab can be added to the Survey tab to go to a maximized view or can be placed on an additional monitor.
  - A new option 2D/3D Split has been added. This option splits the main view into two areas, the left side is 2D the right side is 3D. The size of the areas can be adjusted by dragging the borders to the desired size. Each area has its own functionality set which is accessed from the various accessible ribbons in each area.  
The 2D/3D Split icon acts a toggle to access the view and to close the view.
  - 3D Toggle has been removed
  - 3D project views now close when the project is closed.
- Lot Annotation and Report has been improved to include the optional label of the perimeter distance in the survey view as well as the lot report.
- Inquire Area has been updated to better support area calculations of areas bounded by objects without points.
- Create Plot Window has added a "Total Sheets" input field for plotting multiple sheets. When the "Apply" option is toggled on the field will read the total number of sheets based on the number of sheets created. The field allows for manual edit of the total sheet number when required.
- Extract Drawing is a new option to create a polygon from a plot window (drawing). Plot windows must be displayed using the "Show" option from the Plot Window ribbon group. The option is available in the right mouse button menu when the cursor is located within the Plot window (Drawing) limits.
- Drawing View – added a "color" setting in the North Arrow dialog.
- Selectby has been updated to include the option to select data by Layer Groups.
- Edit Points
  - Added support for manually renaming individual point names/numbers.
  - Added message when there are no results generated based on selected search filters.
- Quick Profile
  - Improved to highlight the profile reference line in the Survey view.

- Added Text Style settings in the display settings to allow size/font to be configured for the DTM name

## DTM (Surface) Functionality

### New Features and Improvements

- Planes – Added functionality to create, edit, display and delete Planes for use in 3DMC and Magnet Field.
  - Plans are displayed in the Survey (CAD) view based on the defined grid settings, specified surface point and defined orientation.
- Merge DTMs – improved the speed of merging large dtms.
- Create Cut/Fill DTM
  - Updated to optionally include a color fill legend as the last step of the dtm creation. The outline of the legend is displayed for positioning in the drawing. To not insert the legend, press the escape key when the outline is displayed.
  - Cut/Fill dtms, when created, will be set to the current dtm for quick inspection of depths in the information toolbar.
  - Added optional compaction coefficient, labeled “Diff Compaction for Fill”. This results in a CF dtm that reflects the depth required to meet a compaction requirement. For example, a 1-foot layer of asphalt with a 10% compaction coefficient would require 1.10’ of depth.
- Insert Legend is a new option located in the DTM Tools dropdown menu. This option inserts a dtm color fill or slope fill/arrow legend in the survey and drawing views. Multiple legends can be inserted for showing color fill shading for multiple dtms individually. Legends can be selected and repositioned at any time. Functionality is supported in Drawing view as well.
- Edit Contour Label is a new option in the Surface ribbon. This allows for manually positioning new contour labels and editing the position of existing labels. Contour labels option in the DTM settings must be on.
- Slope Zone Report – A new optional slope report has been added to the dtm report function. When slope arrows or slope shading is on generating a dtm report will include a report of the slope ranges and their corresponding area.
- Simplify DTM, located in the DTM Tools dropdown, is a new option to simplify a specified DTM. Simplification of the DTM can be accomplished using one of two options,

Edge Contraction or Point Reduction. The selected DTM can be updated or a new DTM created by the simplification. This option is useful for reducing the size of a dtm.

- DTM Manager
  - New controls for triangle display in the 3D and 2D/3D Split views have added in the “3D View Display” DTM Manger dialog group.
    - Solid – shows triangular mesh as a solid color. Color is defined by the mesh color. This option is the default setting
    - Mesh – shows the mesh only
    - Solid + Mesh – shows mesh and solid
    - Settings are applied and retained per DTM
- DTM Tools
  - Export DTM has been updated to include the option to export a dtm as a Trimble Tin Model (\*.ttm) file.
- Merge DTM performance has been improved to speed up the process of merging large dtms.
- DTM Editor - A new modeless DTM Editor UI has been implemented and is accessed from the DTM Ribbon, Create/Edit DTM ribbon group. This UI can always remain open and allows access to other functionality while open. DTM modifications are immediately reflected in the contour configuration and color fill shading if present. The following list of commands have been either moved to or replaced by the new DTM Editor.

#### Moved

- Delete Triangle
- Delete by Line
- Delete by boundary
- Delete by Length or Angle
- Add Triangle
- Swap Triangles
- Decompose Triangle

#### Replaced

- Modify DTM

#### DTM Editor New Functionality

The DTM Editor is made up of four tabs, Delete Triangles, Add Triangles, Surface Data, and Surface Points.

- Pick is a new option that allows the selection of the dtm to edit by simply picking within the boundary of a dtm. To use select the Pick button and pick inside a dtm boundary. This option is also good for identifying dtms when multiple dtms are present. When picked the dtm will briefly shade indicating the dtm selected.
- Highlight is a new option that briefly highlights a dtm specified in the DTM Editor. This is used to confirm the correct selection of the dtm to edit.
- Selection of Triangles for deletion - Triangle deletion can now be accomplished by using selection windows or crossing windows as well as the single pick inside of a triangle.
- Confirm on Delete is now an option, when off deletion is immediate.
- Re-Triangulate on Delete – this option will retriangulate areas where triangles have been deleted during the deletion process. It is also available when Deleting Data or Removing Surface points.
- Fill Gaps is a new option to fill in areas of no triangles quickly. An area to fill can be identified by a single pick with the area or multiple areas can be identified by forming a window around all the areas or by windowing in the entire dtm.
- Add Data is a new option to add within or outside of a dtm boundary. When an object is selected, such as a string, line or polygon, the points linked to the object are selected and the breakline setting for the object is used.
- Add Data within Window is a new option that allows data to be selected by a window selection and add it to the dtm being modified. Triangles created are only within the window formed. This allows for quickly combining multiple dtms into one dtm.
- Delete by Data allows for the deletion of data from a dtm by selecting objects with linked points or points only.
- Edit Surface Point Elevation allows for modifying the elevation of any surface point contained in the dtm. An option is provided to update the linked point if applicable.
- Create Surface Point allows the creation of a surface point within or outside the dtm boundary. When picking inside the boundary the interpolated elevation of the surface point will display in the dialog. This value can be edited another value. If picking outside the dtm boundary the average elevation of the dtm will be displayed in the dialog. This value can be set to the desired elevation. Note that surface points are not named points and not stored in the point database. If the

surface points are required for use in the survey view us the Create Points from DTM option to write them to points database.

- Remove Surface Points allows for removing surface data points from a dtm. Points can be removed individually, or multiple points can be removed using a window selection. The option to Retriangulate on Delete is available for use with this option.
- Undo/Redo is now supported for the delete/add triangles options as well as data additions/deletions or surface point elevation modifications.

## Pad Design

- Multi Pads is a new pad design function. This allows for the design of multiple pads at the same time. Specify a reference surface and the design constraints for each pad such as elevation and side slopes (batters).
  - Side slope layer selection
  - Option to add the side slope layer to the Design layer group for takeoff calculations.
  - Option to create Pads dtm (new dtm created by merging the reference and pads dtm) or create a pad only dtm by using the Trim to Side Slopes option.
  - Located in the Design Ribbon.

## Road View Functionality

- Cross Section Lines is a new option located in the Design ribbon, Cross section group. This allows for the permanent display of section line locations defined in a corridor, road or any design function requiring cross sections and an alignment. Settings for the section lines and labels are provided in the Cross-Section Line dialog.
- Horizontal Alignment curve information has been improved to update terminology and display in larger text.

## Magnet Tools

## General

- Installation of the Civil 3D MAGNET ribbon is now optional during installation.
- Added support of Planes
  - Show and edit in the tabular view.
  - Import/Export by MJF, MaXML, PL3 and TP3.
- Added support for Magnet Field Custom Symbols
- Improved data entry UI in Manual TS Data
  - Allows for data entry in grid of tabular view
  - Properties button added to all manual data entry dialogs
  - Added automatic point number advancement to manual TS data entry dialog
- Enterprise ribbon
  - Removed Chat, Schedule/Timecard functionality
  - Removed News icon
- Check IN/OUT functionality has been improved to revise the license validation logic. The validation check is now determined by the activation process. To enable the Check In/Out functionality the license must be activated using the "Online" method. The "online" method is completed using the in-application activation workflow. "Offline" activation is completed by accessing the Magnet Enterprise or Topcon Positioning website for activation. Product Activation is accessed from the vertical Apps bar located on the left side of the webpage. Once signed into the website options available to the user will appear in this vertical app bar.

This workflow requires entry of the device id for the device the software is installed on as well as entry of an authorization code generated and displayed during the offline activation workflow.

Note: Check In/out functionality is not available when using the following activation methods or license types.

- Offline activation
  - Perpetual license
  - Subscription license
- Activation to a USB key
  - Perpetual license
  - Subscription license
- Educational licenses
- Perpetual with expired Service Plan
- Trial licenses

## Coordinate Systems

- Additional settings for datums such as NAD27, NAD27(CSRS) and NAD83(CSRS) are now centrally located in the Settings dialog accessed from the Job Configuration UI.

- Added optional display of Ellipsoidal height together with Elevation in the Points tabular view.
- Added "Datum (Xc/Yc/Zc to the Tabular view for display of any datum XYZ coordinates.
- Added Support of equidistance cylindrical projections for maps.
- Added Egyptian projections.
- Updated Singapore geoid SGEOID09
- Added Estonian geoid EST-GEOID2017
- Added Spain datum NTV2SPAIN

## User Interface

- Added Tooltips to tabular view headers for full name viewing
- Standardized Ephemeris header titles
- Updated term GPS to GNSS in tabular view and applicable views.

## Import/Export

- Added support for transferring text labels to AutoCAD dwg files.
- Updated export custom format to support adding label for undefined coordinate. When defining a custom format, the option Use Coordinate Placeholder option allows for entering a label for the placeholder.
- Added import/export support for Geocomp files.

## Adjustment

- The Process ribbon has been updated to include two new icons, Adjustment by Least Squares and TS-Traversal Adjustment by Compass Rule. The setting for default adjustment type has been removed from the Configuration dialog.
- Added normalized residuals to the rejection criterion options in the Process Properties of Least Squares adjustment. The following residual types are available:
  - X Y Z
  - N E U
  - Distance Angle Elevation
- Updated Blunder Treatment options to include "Automatic Blunder Reweighting".
- GPS Loop Closure user interface has been improved.



## Reports

- New table format templates are provided which allows for table and cell formatting. The following reports were replaced with this new format.
  - Localization
  - Field Report
  - Adjustment
  - Project
- Added Import/Export support for reports. This allows for transfer of report formats to and from other computers running Magnet Tools.
- GNSS Observation report; added new fields relating to precision and adjustment.
  - Error circles and error ellipses
  - Normalized residual (Standardized residual)
  - From point code and To point code columns
  - Vertical error and selected confidence level
  - Time only field (Start Time)
  - GPOD values
- TS Observation report new fields for reporting
  - Added option to report x,y,z of target point
  - Normalized residual (Standardized residual)
- Point report new fields for reporting
  - Error ellipses
  - Circular probable error with selected confidence level
- Field reports
  - Added support for multiple images

## Miscellaneous

- Added filtering of Import from Internet results

- Added Vienna Mapping functions for post processing.
- Added ability to display vector length for non-processed vectors
- GPS Observations improved to support selection of vectors by length and adjacent angles for network selection to be post processed.
- GNSS (GPS) View disable/enable occupations has been improved
  - Part of an occupation can be disabled/enabled by right click on the occupation and selecting disable or enable "SV's in epochs: ??"
  - Optionally the entire occupation can be disabled/enabled by selecting "Enable or Disable SV's: ??"

## Magnet Tools ribbon in AutoCAD and Magnet Exchange for Autodesk

- Support of Civil 3D 2013 and 2014 has been remove and no longer supported.

## MAGNET 3D Exchange - V7.0

### General

## Magnet 3D Exchange v7 Release Notes

The following new additions/revisions have been made to Magnet Office v7.0 products.

Please take time to read the release notes. They contain information about the following:

- New Features
- Improvements
- Bug Fixes

### System Requirements:

Operating System

Microsoft Windows 10 (64-bit version)

Microsoft Windows 8 (64-bit version)

Note: Starting with Magnet Office v7 Windows 7 is no longer supported.

Processor Speed

2GHz Core2 processor or higher

RAM

2GB RAM or more recommended

Memory

Local hard drive space of 2GB or higher recommended

Computer Resolution

1280x1024 display resolution

Internet Connectivity

Can be required by some functionality.

### General Functionality

#### New Features and Improvements

- Performance - Improved and optimised various areas of the program for efficiency including opening, import/Export, Data Clean up, DTM functions, large jobs etc
- Object Selection has been updated to support holding the CTRL key and dragging a

window around data to be removed from a selection.

- Modeless Panels can now be collapsed if undocked by clicking on the top left corner of dialog.
- Select Path by Bounded Area is a new option accessed from the right mouse button menu. This option allows the creation of a closed object, string, polygon, boundary, lot, pad by picking inside a bounded area. The bounded area can be enclosed by multiple objects. The routine will highlight the determined area and prompt for confirmation.
- Import/Export
  - Added Import/Export support for Lidar point cloud LAS files (\*.las, \*.laz).
  - Added Export to SurPac string format (\*.str)
  - Added Import/Export of KMZ and Export of KML files.
  - Added Import of Japanese XML file format.
  - DWG format
    - Updated to included option to export metric jobs to millimeters.
    - Updated to include “tadpole” arrows for side slope (batters) indicators
    - Import linetypes supported
    - Export improved to support export of point elevations with Use in Surface ON. Elevations of point with Use in Surface off are exported with elevation 0.
  - MJF Import/Export has been updated to support Magnet Field custom symbols.
- Selection Cycling is a new option located in the Program Settings, Preferences tab and the Settings ribbon for quickly turning on and off. By default, this setting is on. When ON, selecting objects that are overlaying other objects or points which are near other points, a dialog is displayed listing the objects available for cycling. To select the data to work with, select it from the list. When multiple points are listed in the cycle list, the keyboard arrows can be used to browse the listed points. The selected point is highlighted during browsing the points.
- Cloud Connections
  - Added support for connecting to Sitelink 3D V1 and V2 Sites from the Cloud Connections ribbon, Sitelink 3D ribbon group.
- Previous Selection has been improved to reselect all data included in the last selection set. This option is in the Right Mouse Button context menu as well as the Edit Ribbon.
- 3D View has been improved by adding new options.

- New 3D Tab has been renamed to 3D View. By default, the 3D view opens as a vertical tab. This tab can be added to the Survey tab to go to a maximized view or can be placed on an additional monitor.
- A new option 2D/3D Split has been added. This option splits the main view into two areas, the left side is 2D the right side is 3D. The size of the areas can be adjusted by dragging the borders to the desired size. Each area has its own functionality set which is accessed from the various accessible ribbons in each area.  
The 2D/3D Split icon acts a toggle to access the view and to close the view.
- 3D project views now close when the project is closed.
- Inquire Area has been updated to better support area calculations of areas bounded by objects without points.
- Edit Points
  - Added support for manually renaming individual point names/numbers.
  - Added message when there are no results generated based on selected search filters.
- Quick Profile (3D Exchange, Survey, Site, Construction, Project)
  - Improved to highlight the profile reference line in the Survey view.
  - Added Text Style settings in the display settings to allow size/font to be configured for the DTM name

## DTM (Surface)/Roads Functionality

### New Features and Improvements

- Horizontal Alignment curve information has been improved to update terminology and display in larger text.
- Planes – Added functionality to create, edit, display and delete Planes for use in 3DMC and Magnet Field.
  - Planes are displayed in the Survey (CAD) view based on the defined grid settings, specified surface point and defined orientation.
- Merge DTMs – improved the speed of merging large dtms.
- Create Cut/Fill DTM
  - Updated to optionally include a color fill legend as the last step of the dtm creation. The outline of the legend is displayed for positioning in the drawing. To not insert

the legend, press the escape key when the outline is displayed.

- Cut/Fill dtms, when created, will be set to the current dtm for quick inspection of depths in the information toolbar.
- Added optional compaction coefficient, labeled "Diff Compaction for Fill". This results in a CF dtm that reflects the depth required to meet a compaction requirement. For example, a 1-foot layer of asphalt with a 10% compaction coefficient would require 1.10' of depth.
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- Slope Zone Report – A new optional slope report has been added to the dtm report function. When slope arrows or slope shading is on generating a dtm report will include a report of the slope ranges and their corresponding area.
- DTM Tools
  - Export DTM has been updated to include the option to export a dtm as a Trimble Tin Model (\*.ttm) file.
  - Check DTM has been added. It checks the specified DTM for issues in the triangles.
- DTM Manager
  - New controls for triangle display in the 3D and 2D/3D Split views have added in the "3D View Display" DTM Manger dialog group.
    - Solid – shows triangular mesh as a solid color. Color is defined by the mesh color. This option is the default setting
    - Mesh – shows the mesh only
    - Solid + Mesh – shows mesh and solid
    - Settings are applied and retained per DTM
- DTM Editor - A new modeless DTM Editor UI has been implemented and is accessed from the DTM Ribbon, Create/Edit DTM ribbon group. This UI can always remain open and allows access to other functionality while open. DTM modifications are immediately

reflected in the contour configuration and color fill shading if present. The following list of commands have been either moved to or replaced by the new DTM Editor.

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- Decompose Triangle

#### Replaced

- Modify DTM

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- Confirm on Delete is now an option, when off deletion is immediate.
- Re-Triangulate on Delete – this option will retriangulate areas where triangles have been deleted during the deletion process. It is also available when Deleting Data or Removing Surface points.
- Fill Gaps is a new option to fill in areas of no triangles quickly. An area to fill can be identified by a single pick with the area or multiple areas can be identified by forming a window around all the areas or by windowing in the entire dtm.
- Add Data is a new option to add within or outside of a dtm boundary. When an

object is selected, such as a string, line or polygon, the points linked to the object are selected and the breakline setting for the object is used.

- Add Data within Window is a new option that allows data to be selected by a window selection and add it to the dtm being modified. Triangles created are only within the window formed. This allows for quickly combining multiple dtms into one dtm.
- Delete by Data allows for the deletion of data from a dtm by selecting objects with linked points or points only.
- Edit Surface Point Elevation allows for modifying the elevation of any surface point contained in the dtm. An option is provided to update the linked point if applicable.
- Create Surface Point allows the creation of a surface point within or outside the dtm boundary. When picking inside the boundary the interpolated elevation of the surface point will display in the dialog. This value can be edited another value. If picking outside the dtm boundary the average elevation of the dtm will be displayed in the dialog. This value can be set to the desired elevation. Note that surface points are not named points and not stored in the point database. If the surface points are required for use in the survey view use the Create Points from DTM option to write them to points database.
- Remove Surface Points allows for removing surface data points from a dtm. Points can be removed individually, or multiple points can be removed using a window selection. The option to Retriangulate on Delete is available for use with this option.
- Undo/Redo is now supported for the delete/add triangles options as well as data additions/deletions or surface point elevation modifications.