

# LINKPlanner Release Note for Version V4.6.3

September 2017

The information in this document is subject to change without notice. The recommendations, technical data, configurations and statements in this document are believed to be reliable and accurate, but are presented without implied or express warranty. Users must take full responsibility for their applications of any product specified in this document. The information in this document is proprietary to Cambium Networks Ltd.

## ***Introduction***

This document provides information for the Cambium Networks LINKPlanner version V4.6.3.

The LINKPlanner is an application that runs on Windows or Macintosh. It performs the calculations from the ITU recommendations ITU-R P.526-10 and ITU-R P.530-12 (or Vigants-Barnett) to predict NLoS and LoS paths for anywhere in the world. Path profile data can be obtained in a number of different ways depending upon global location. Trees and buildings (obstructions) will modify this profile, and often the path must be surveyed to establish the correct estimation.

The LINKPlanner provides results specific to the cnReach, ePMP, PTP 250, PTP 300, PTP 400, PTP 450, PTP 450i, PTP 500, PTP 600, PTP 650, PTP 670, PTP 700, PTP 800, PTP 810 and PTP 820 family of wireless bridges and PTP 670 HCMP, PTP 700 HCMP, PMP 450, PMP 450i, PMP450m and ePMP family of PMP network devices, giving the data rates and reliability that can be expected given the specific design features of these products.

## ***New or Changed in version 4.6.3***

- cnReach
  - Added the following bands/regulations in PTP mode
    - UHF 406-430 MHz United States
    - UHF 450-470 MHz United States
    - 700 MHz United States
    - 900 MHz Australia
  - Added new antennas, power supplies and warranties to existing 900 MHz
  - Updated sensitivity values based on Rel 01-10 for 900 MHz
- ePMP
  - Added Force 190 as PTP and as an SM in PMP

- PMP 450 family
  - Added PMP 450b Mid-gain as an SM option
- cnPilot
  - Added E410, E501S, E502S, E600 to BOM Estimator
- PTP 670
  - Update Brazil to "In Service"
  - Updated Cambium unlicensed antennas to Global availability
  - Removed "Preliminary" from HCMP
  - Added new country/band options, primarily to HCMP
- PTP 700
  - Modified PTP 700 to show two product variants:
    - PTP 700 C+I which incorporates the Integrated and the suffix A PTP 700 connectorized performance. All existing projects will open with the "old" PTP 700 as PTP 700 C+I
    - PTP 700 C-Only shows the new suffix B connectorized PTP 700 performance
  - All PTP 700 products are now only available in the Global SKU
  - Improved Integrated Antenna performance
- General
  - Added ability to save and recall table view configurations
  - Added Magnetic North Bearing to table views

### ***Bug Fixes in version 4.6.3***

- Fixed problem on PMP 450m not fully utilizing EIRP above 38 dBm
- Removed Spatial Diversity option from ePMP PTP and PTP 450 family links, as they do not support spatial diversity
- Fixed error when changing from 900 MHz cnReach to PTP 810
- Fixed error when exporting PTP 450/450i configuration files
- Prevented PTP 820i resetting to default 1 ft flex waveguide on project opening
- Removed extra PTP 820i Fixed Tuned connectors from 11 GHz BOM
- Removed PTP 820G and PTP 820S Remote Mount Adaptor for 1+1 HSB and 2+0 Co-Polar

### ***Bug Fixes in version 4.6.2***

- Replace missing Force 180/200 products from SM BOM and BOM Estimator

### ***New or Changed in version 4.6.1***

- PTP 670
  - Added HCMP functionality for the PTP 670 family on the PMP side of LINKPlanner
  - Updated antenna options across PTP 670 and PTP 670 HCMP
- PTP 700
  - Updated antenna options including introducing new wide band antennas across 4 and 5 GHz bands
- PTP 650
  - Notification of obsolescence of PTP 650 radios included in the BOM
- PMP/PTP 450 family
  - PMP 450m
    - Increased product EIRP limit to 42 dBm
    - Updated regulatory information for FCC
  - PMP/PTP 450/450i
    - Added Malaysia in PTP mode
    - Added Colombia, Ecuador, Panama and Venezuela at 900 MHz
- PTP 820
  - Added NTIA options for PTP 820C at 7, 8, 15 and 23 GHz
  - Extended PTP 820G NTIA options to include 15 and 23 GHz
- General
  - Improved selection capability for Optional Extras in the BOM to allow selection/deletion of multiple items simultaneously
  - Improved selection of columns in LINKPlanner tables to allow selection/removal of multiple items simultaneously and column ordering.
  - Added ability to unlicensed band to use spatial diversity with dual polarization antennas
  - Added grouping to antenna selection list to group antennas by Cambium, User, 3rd party and Obsolete.
  - Updated some unlicensed band Cambium part numbers to obsolete

- Added warning on extended frequency range antennas at 4.9 and 5.9 GHz

### ***Bug Fixes in version 4.6.1***

- Prevented Google map from zooming when initial site is created
- Prevented error on map when doing CSV imports
- Fixed throughput calculations for cnReach when in single fixed mode
- Added missing XPIC license to PTP 820 4+0 XPIC BOM
- Corrected PTP 820 24 GHz radio quantities for 2+0 configurations
- Added missing fixed tuned connectors in BOM for PTP 820i
- Corrected modulo 360 issue when adding multiple AP's from the "Add new hub" menu
- Corrected error when deleting a large number of APs
- Allow multiple editing for "AP Mod Mode Required" in PMP tables
- Fixed issue with selection of PTP 820 Warranties in the BOM
- Corrected issue when creating PTP 820 2+x links in the BOM Estimator

### ***New or Changed in version 4.6.0***

- PTP 670
  - Introduced 5 GHz PTP 670
  - Updated antenna list for PTP 670 ATEX/HAZLOC to use new Cambium unlicensed antenna range
  - Added 1 year extended warranty automatically to BOM
- PTP 700 Rel 700-02-50
  - Increased maximum number of Slaves in HCMP to 8
  - Introduced different symmetry options
  - Increased max range to 40 km for most configurations
  - Added new Cambium unlicensed antenna options
  - Added 1 year extended warranty automatically to BOM
- CMM5
  - Added CMM5 as a Sync option for both PTP 670 and PTP 700 (including HCMP)
- PMP 450 family Rel 15.1.1

- PMP 450m
  - Added 5, 10 and 15 MHz bandwidths
  - Improvements in uplink sensitivity
  - Updated antenna pattern
  - Updates to country regulations, including new countries
- PTP/PMP 450/450i
  - Addition of 15 MHz in DFS countries for PMP
  - Updates to country regulations
  - Removed 5 MHz duty cycle restriction
  - Updated US DFS duty cycle restriction to apply to 450i and 450m as well as 450
- PTP 820
  - Added a "Clear All" option on the frequency selection tables
  - Updated Installation reports
  - Added 1 year extended warranty automatically to BOM
- PTP 800
  - Updated couplers to new part numbers to replace obsolete parts
  - Notification of Dual-Pol antennas with OMK going obsolete
  - Added 1 year extended warranty automatically to BOM
- PTP 600
  - Retired 45600 and 48600

### ***Bug Fixes in version 4.6.0***

- Ensure that PTP 700 Lite radio kit selection follows correct defaults from Options and country selections
- Unlicensed PTP - added additional LPU to Optional Extras
- Corrected issue with reflection parameters causing infinite loop on rules processing

### ***New or Changed in version 4.5.4***

- PTP 820
  - Added support for 4+0 on PTP 820C
  - Added support for 2+2 SD on PTP 820C

- Added support for independent path configurations on 2+x paths
- PTP 820G
  - Updated LPU in BOM from WB3657 to N000082D012
  - Limit minimum profile to Profile 0 for 1+1 Hot Standby options
  - Added 50 and 60 MHz bandwidths to 7 and 8 GHz NTIA bands
- Modified name of PTP 820i Spatial Diversity options to show Split End configuration as recommended option
- Added another optional power supply for PTP 820S
- Added AFR Activation key, H-QOS key and MC-ABC key to optional extras
- Removed capacity upgrade keys from optional extras
- PMP 450/450i
  - Added 30 and 40 MHz bandwidths in DFS regions in 5 GHz band for PMP/PTP 450/450i
    - Note PMP 450 AP does not support 40 MHz
  - Added 15 MHz bandwidth for 900 MHz
- ePMP
  - Added 2.5 GHz for Brazil and Other country regions
- PTP 670
  - Introduced 4.8 GHz for Mexico
- Unlicensed PTP
  - Modified Space Diversity to differentiate between reflections and tropospheric multipath mitigation

### ***Bug Fixes in version 4.5.4***

- PTP 820C 2+2 configurations - corrected quantity of license keys in BOM and added missing splitter for remote mount dual polarization antennas
- PTP 820C 2+2 XPIC - corrected XPIC factor in calculations
- PTP 820 and 810 2+x Aggregate Link - Corrected Mean IP Predicted and Aggregate IP Throughput in Performance Summary to match Performance Details
- Ensured that channel plan color changes correctly update in navigation tree
- Corrected network error on start-up when LINKPlanner cannot locate contacts information

- Corrected reported EIRP in PMP so that it correctly reflects changes in transmit power (display only, doesn't affect calculations)
- Corrected issue with rain reliability for very small fade margins
- Fixed issue with link panels not updating correctly when switching between 2+0 products
- Corrected issue with profiles not automatically requesting properly

### ***New or Changed in version 4.5.3***

- PMP 450/450i
  - Added 40 MHz bandwidth for Rel 15.1
  - Added additional country options to PMP/PTP 450i at 5.4 and 5.8 GHz, updated regulations for PTP 450 for Vietnam and Norway.
- Map
  - Added American Tower locations to Google Map view and ability to create a network site from an American Tower location
  - Added ability to drag site locations to new positions on Google map for any sites not yet linked to anything else.
  - Added ability to use the preferences to control the site color, size and label size on the Google map as on the Offline map
- ePMP
  - Added L-Com omni antenna at 5.8 GHz
- PTP 820
  - Updated 7 and 8 GHz NTIA to offer FIPS modem for PTP 820G
  - Updated PathLoss files in line with Rel 9.0
- PTP 800/810
  - Notify IRFU parts as obsolete and PTP 800i/810i products as Retired
- PMP
  - Improved AP Availability calculation to take advantage of ATPC at the SM. This can improve the Max Usable Mode at the AP if the SM is not using maximum power under typical conditions.
  - Added Narrow Beam High Gain 5 GHz AP Antenna
  - Updated Split AP command to allow option to split to 2, 3 or 4 APs
- General
  - Reordered product choices to move retired products to the bottom of the selection list

### ***Bug Fixes in version 4.5.3***

- Changed upper limit for unlicensed cable lengths to allow cables longer than 100m
- Prevented BOM errors when a user creates an AP for 3 GHz with PMP450i and United States
- Fixed error when importing csv file if one or more SMs are out of range
- Prevent errors when creating a custom antenna from an in-built antenna
- Fixed errors in channel plans to ensure that only channels within range are used and all channels in the range are shown
- Improved custom fields so that additional options can be added to lists and default values changed without updating existing allocations.

### ***New or Changed in version 4.5.2***

- PTP 670
  - Added PTP 670 ATEX/HAZLOC as Preliminary
- ePMP
  - Added ePMP 2000 in PTP Mode
- PTP 820
  - Added 24 GHz in ETSI for PTP 820C and PTP 820S
  - Added 59.3 MHz bandwidth to Lower 6 GHz ETSI
- cnReach
  - Improved capacity calculation to take account of Max Payload Bytes setting
- PMP 450m
  - Added SFP parts to Optional Extras
- General
  - Added ability to duplicate an AP and split the SMs between the original and new AP
  - Improved the ability to add multiple APs to each hub

### ***Bug Fixes in version 4.5.2***

- Fixed two issues with Calc Tilt function to ensure that the number of connected subscribers are taken into account and improve the throughput calculations in DL MU-MIMO mode for PMP 450m



- Corrected antenna polarization for Japan 29 dBi antenna
- Corrected BOM for 5.1/5.2 GHz in United States for PMP 450i
- Corrected issue with PTP 820 performance calculations for 7 and 14 MHz with MC-ABC
- Improved frequency channel handling when changing link types in licensed band
- Removed Tx Frequencies from licensed band PTP Equipment template to prevent configured frequencies from being overwritten.
- Improved Best Server function to allow support for multiple subscriber places at the same location.
- Corrected PTP 820C 2+2 MC-ABC throughput limits for wide bandwidths

### ***New or Changed in version 4.5.1***

- PMP 450 family
  - Added 3 GHz PMP/PTP 450i
  - Added 5 GHz band PMP/PTP 450i ATEX/HAZLOC as Preliminary
  - Added a default power supply and power cords automatically to the Access Point for both PMP 450 and 450i
  - Added 5ms Frame Period for PMP/PTP 450/450i for 5.4 GHz in ETSI
- PTP 820
  - Added 59.3 MHz bandwidth at 8 GHz ETSI with T/R spacing 311.32 MHz
- PTP 650
  - Added support for Rel 650-01-43, which updates region code options and available antennas for Japan
- ePMP
  - Added support for Rel 14.2 which adds New Zealand at 5.2 and 5.4 GHz
- PTP 800/810
  - Added notification about pending obsolescence of the IRFU
- General
  - Improved the frequency selection process for complex licensed band link types
  - Added additional LPU option to all outdoor PTP radios

### ***Bug Fixes in version 4.5.1***

- Resolved issue to allow custom antennas to be added at 900 MHz on PTP links

- Fixed issue with configured remote frequency not appearing in frequency selection lists
- Resolved update issues with PMP 450m throughput calculations when changing SM configuration
- Corrected sensitivity values for PMP 450m subscribers that are not grouping and minor change to PMP 450m throughput calculation
- Moved the "Purge Profiles" command to the Project menu, so that it is visible for Mac users

### ***New or Changed in version 4.5.0***

- Best Server Analysis (Windows version only)
  - Added a feature to automatically determine the best access point in a network layer for each subscriber site, based on defined design criteria
- PTP820
  - Added 2+2 Hot Standby Configurations for PTP 820C
- ePMP
  - Added 4.9 GHz to PMP and PTP Force 200
- PTP 700
  - Added the Sync option to HCMP
- PMP 450m
  - Highlight ungrouped SMs in the SM table and include a column to show if the SM is grouped
- General
  - Added a "Modeled Beamwidth" to the Access Point Equipment panel so that the user can set a narrow beamwidth value to make it easier to plan the network - this replaces the project level Sector Coverage function.
    - Existing access points in legacy project files with the Sector Coverage set to Enhanced will have the Modeled Beamwidth set to the enhanced value. All new access points will default to the nominal beamwidth.
  - Added a "Calc Tilt" option to the Access Point Equipment panel that can be used to calculate the angle which will offer the maximum throughput
  - Added a new report option so that network level and hub level PMP installation reports only contain the access point information.
  - Restricted the input precision of coordinates to 5 decimal places (~1 m)
    - This change will allow sites exported through the sites tables to be imported without any loss of precision

- Users may notice a slight change in path length (< 1 m) and minor differences in the predicted performance
- Display a single warning when importing KML/KMZ files with duplicate sites rather than prompting for each site
- Highlight duplicate sites when importing from a CSV file
- Added a separate CSV import command for network sites and subscriber sites
- Added the Spatial Frequency, AP/SM Description and the AP/SM Site Description to the PMP Links table
- Added 3m fixed length cable (RDN5785) to unlicensed PTP cable selection list
- Added the ability to purge unused profiles from the project file to reduce file size
- Added the height labels to both sides of the path profile plot so that it is easier to read the remote height

### ***Bug Fixes in version 4.5.0***

- cnReach
  - Prevented error when changing the band after selecting 0.9 GHz / cnReach
- PMP 450m
  - Ensure that the groups are always recalculated when the AP or SMs are updated
  - Fixed the SM Receive Level calculation so that it uses the user-defined EIRP value rather than maximum power
  - Corrected the mechanical tilt range for the antenna
- PMP 450i
  - Removed the tilt bracket from the BOM when the 90/120 deg Sector Antenna is selected
  - Corrected the mechanical tilt range for the obsolete integrated antenna
- CSV Import
  - Fixed the PMP Links CSV importer so that it can handle spreadsheets with additional "ignore" columns
  - Allow the user to define multiple APs at the same azimuth in a CSV file
  - Allow similar or duplicate sites and links
- General

- Fixed the sort order of items in the tree, tables and CSV export when the names contain "-"
- Corrected the "Max aggregate IP throughput" title in link summary table of project reports
- Fixed the warning when running the change access point command and the current AP is selected
- Prevented the error from occurring when changing the product using the link table on a site page
- Prevented errors on the Mac version when resizing warning panels

### ***New or Changed in version 4.4.1***

- cnReach
  - Add N500 at 900 MHz in PTP mode
- PTP 700
  - Changed band name from 4.5 to 4.7 GHz to match product naming
  - Removed Preliminary from PTP 700 EU countries at 5.8 GHz
  - Added support for 4.7 GHz for HCMP
  - Added 10 and 40 MHz bandwidths to HCMP
  - Added Over the Air Rekey license to Optional Extras for HCMP
- CMM
  - Added support to optional extras for the 56V CMM5 module
- ePMP
  - Modified ePTP throughput for System Release 3.0 enhancement
  - ePMP 2000 - changed default surge suppressor to Gigabit Surge Suppressor
- PTP 820 - support for Release 8.5.5
  - Added ability to set a Minimum Mod Mode in ACM
  - Increased Adaptive Transmit Power Control to include 2048 QAM on PTP 820G
  - Updated the Radio Commissioning Notes to match Quick Installation Wizard order.
  - Increased the number of Surge Suppressors in the BOM for a PTP 820S link
- PMP 450m
  - Modified AP power setting to configure EIRP instead of Transmit Power.

- BOM Estimator
  - Added default antenna heights for the AP for PMP 450i and PMP 450m and at both AP and SM for PTP 700 HCMP, to allow cable quantities to be estimated.
  - Corrected part numbers for cnPilot E500 in Argentina, Australia, Brazil and China.
- General
  - Reports - added warning about estimated report size
  - PMP reports - changed the Max Power setting for SMs to allow SMs to take advantage of ATPC and added an Operational Transmit Power for each SM
  - Added System Gain Margin and Fade Margin at Max Usable Mode to PMP links views
  - Removed the Save as V3 command

### ***Bug Fixes in version 4.4.1***

- PMP 450 family - corrected Max VC limit for PMP 450i and at 30 MHz bandwidth for PMP 450
- Corrected cable aggregation quantities in the Network BOM and BOM Estimator
- PTP 820 RFU-A corrected BOM quantities for 2+0 SP Branching Drawers and added Blanking Panels to 1+1 HSB SD links
- Corrected error in PMP Equipment Templates where product is not valid in new band
- Corrected error when trying to hide columns in an empty table
- Corrected error when deleting the SM Range value
- Ensure hidden items are not visible when opening projects or pasting in copied items
- Fixed issue which was stopping collapsible panels from resizing after being expanded
- Corrected issue when duplicating APs and associated subscribers, when there are multiple subscribers at the same location
- Prevented PMP Equipment Templates from overwriting AP antenna orientation values
- Corrected PMP Performance Details display for unused Modulation Modes on ePMP and PTP 700 HCMP
- Corrected PTP 700 HCMP Max Usable Mode selection order (affects 16 QAM 0.63 Dual)

### ***New or Changed in version 4.4.0***

- Added ePMP 2000 in non-beamforming mode
- Added PTP 700 HCMP at 4.9 GHz
- Added support for 450 family Rel 14.2
  - Added 15 and 30 MHz bandwidths in non-DFS regions
  - Updated capacity algorithms to improve prediction against measured - this does NOT change throughput rates on the product.
  - Updated sensitivity and noise figures
  - Updated 900 MHz regulations for Australia and New Zealand
- Updated PMP 450i Integrated Antenna to use Cambium sector antenna
- Added ability to export only selected columns from table views to csv file
- Improved performance of batch changes in the table views
- Replaced chm help with on-line help
- Added electrical tilt information to AP antenna tilt hover help
- Changed default licensed band product to PTP 820S
- Obsolete PTP800 and PTP810 at 26 - 38 GHz
- Added a measuring tool to the offline map, which shows the range and bearing from a selected point

### ***Bug Fixes in version 4.4.0***

- PTP 820 - removed 200 and 300m optical cables from optional extras
- PTP 820 - corrections to Cambium antennas and pattern files
- PTP 820 - RFU-A corrected minimum transmit power
- PTP 450 / 450i set max range limit to 200 km
- Corrected heading and AP BOM on PMP BOM Estimate dialog
- ePMP removed CMM as synchronization source options at 40 MHz bandwidth
- ePMP - updated noise figures
- Corrected sort option by product name in table view
- Fixed PMP Templates so that new subscriber modules follow template

### ***New or Changed in version 4.3.12***

- Added cnMedusa as Preliminary

- Select AP product as PMP 450m
- General
  - Added ability to create a link to an AP from a subscriber site
  - Added ability to change AP for multiple SMs
  - Reduced default SM Target Receive Level to -54 dBm
  - Removed notes from parts that are now available to order
  - Added click-through image to start-up page to link to Cambium product information videos on Mac version

### ***Bug Fixes in version 4.3.12***

- Updated default priority of PMP AP antennas, so that ePMP defaults to Integrated antenna rather than PMP 450 antennas
- Corrected Fixed Tuned connector items in PTP 820i BOM at 11 GHz
- Corrected Lower 6 GHz antenna selection options for PTP 820i
- Moved default position of Feeder Losses window for All Indoor link types to higher up the page so that the OK button is available on smaller monitors
- Corrected issues with SM Range so that only SMs within SM Range rather than Max Range are available for connection in the New PMP Link window
- Ensure that any profile changes (e.g added obstructions) are maintained when switching an SM between two APs on the same hub
- Use the formatting rules to control the color of the AP name in the tree

### ***New or Changed in version 4.3.11***

- PTP 820
  - Added PTP 820i with RFU-A at Lower 6, Upper 6, 7 and 11 GHz for FCC and Canada.
  - PTP 820G added "narrow" 80 MHz bandwidth.
  - Added 10 GHz frequency band for ETSI.
  - Added 18 GHz frequency band for Brazil.
  - Updated APAC and EMEA antennas.
  - Updated PTP 820G to use the new script files for the wider 28/30 MHz when in ETSI 1+0, 1+1, 2+0 Cross-Polar or 2+0 XPIC modes.
  - Added 56 MHz to PTP 820S at ETSI 7 GHz with 154 MHz T/R spacing for 1+0 and 1+1 link types.
- PTP 650 01-42

- Updated FCC DFS regulations and 5.4 GHz FCC regulatory band.
- cnPilot
  - Added E500 to BOM Estimator.
- General
  - Added click-through image to start-up page to link to Cambium product information videos.
  - Modified PMP Max range to 1 decimal place resolution allowing greater resolution of cell sizes for map display and to control SM selection. This function now also allows cell sizes to be defined in kilometres for the PMP 450 family.
  - Improved navigation tree updates to speed up refreshing with larger projects.

### ***Bug Fixes in version 4.3.11***

- Prevent errors when re-creating links that have been deleted.
- Fixed issue on antenna heights when importing links csv file with multiple links from the same site.
- Updated the PMP 450 High Gain Integrated Antenna Model Number in the 3.65 GHz FCC Device Registration Export.
- Fixed error when setting 0.9 GHz channel plan.
- Fixed error in ePMP SM Performance Details when restricting Maximum Modulation Mode to below MCS 15.
- Fixed error with custom fields not transferring when an SM is transferred from one AP to another.
- Improved positioning of pop-out panel on a Mac so that close window icons are always visible.
- Updated Map functionality to ensure subscriber sites respect default colour settings.

### ***New or Changed in version 4.3.10***

- Added ePMP 90/120 Sector Antenna
- PMP/PTP 450i
  - Added 5.2 and 5.4 GHz for United States
  - Added 5 MHz bandwidth to ETSI
    - Note 450/450d SM are NOT supported with 5 MHz BW
  - Added Australia at 5.4 and 5.8 GHz



- PTP 820
  - Added 32 GHz for PTP 820C and 26 and 38 GHz for PTP 820S
  - Added 40, 50, 56 and 60 MHz bandwidths for PTP 820C 2+0 with Spatial Diversity
  - Added 14 MHz Bandwidth for PTP 820G in 2+0 XPIC
  - Updated Occupied Bandwidth for Release 8.3
- PTP 650 - Updated Japan regulations
- General
  - Improved memory usage to allow saving of larger files
  - Allow SMs to be easily switched from one AP to another
  - Improve the sort order process when exporting PMP tables to csv

### ***Bug Fixes in version 4.3.10***

- Fixed error on ePMP PTP links when frame size set to Tolly Mix
- Reinstated toolbar search functionality
- Corrected error when exporting Subscriber Site Custom Field
- Fixed error when creating PMP Sales report
- Fixed issue when performance summary panel showing no information
- Improved editing functionality to prevent loss of focus in text fields
- Added sensitivity data to PTP 820G to correct performance calculations
- Removed FCC Antenna warning from non-FCC countries
- Fixed errors when duplicating integrated antennas
- Corrected number of T1s available for PTP 820G

### ***New or Changed in version 4.3.9***

- Added PTP 450 at 900MHz
- Created WiFi section in BOM Estimator to support cnPilot
  - Changed BOM Estimator to separate tabbed sections for PTP, PMP and WiFi
- Added Quick Deploy Positioner as Optional Extras to PTP 450i, PTP 650, PTP 700 and PMP 450i SM
- Updated In Service countries for PTP 650 and PTP 700
- Added AP Formatting Rules

- Added Performance parameters to SM Templates
- Improved response speed for multiple simultaneous profile requests
- Update Commscope antenna information in-line with latest Commscope updates
- Added additional K-factor information to pop-up Performance Summary and warnings if LOS links do not clear worst earth curvature.

### ***Bug Fixes in version 4.3.9***

- ePMP - prevent high gain custom antennas from appearing in selection and fixed error when deleting PTP links after creating high gain antenna
  - added gain limits information window to new antenna dialog.
- Fixed error when deleting access points
- PMP 450i 900 MHz - Changed SM product name to PMP 450
- Fixed error which was capping top mode throughputs on Force 180/200
- ePMP 1000 Fixed missing throughput limit in Max data rates shown in PMP Link Performance Details
- Prevented Channel frequency warning from appearing when the regulation has split channel range
- Provided support for PTP 700 Lite at 4.5 GHz
- 450 family fixed UL capacity calculations missed from V4.3.8 update, slightly increases uplink throughput in some scenarios.

### ***New or Changed in version 4.3.8***

- ePMP - Support for Release 2.6
  - Addition of 5 and 10 MHz bandwidths for ePTP
- PxP 450i
  - Added 5.1 GHz band to United States and Other-FCC
  - Modified default power supply used for SM and PTP links
  - Updated capacity algorithm resulting in a slight improvement in throughput
- PTP 700
  - Updated FCC/Canada regulatory information
  - Removed Preliminary from Canada at 5.2 and 5.4 GHz and ETSI at 4.9, 5.1 and 5.4 GHz
  - Modified sensitivity and transmit power values which will reduce mean throughput, especially in TDM modes.

- PMP
  - Added SM equipment to PMP Equipment Templates
  - Added max data rate for a single subscriber to SM Performance Details
  - Updated CMM Power Supplies
- Optimized selection of country options for power leads and product kits
- Added capability to search for part numbers as a menu option under the Project menu
- Obsolete Commscope 11 GHz 2.6 ft and 5 GHz 2 and 3ft antennas

### ***Bug Fixes in version 4.3.8***

- Corrected error when changing bands in Access Points table
- Added missing fiber parts from PTP 820 Optional Extras
- Corrected error when switching to PTP 820S from a 1+1 SD link
- Corrected High Gain Integrated antenna model number in PxP 450 FCC Device Registration

### ***New or Changed in version 4.3.7***

- Added support for PTP 820 Rel 8.2
  - PTP 820C and PTP 820S - Added 10 and 20 MHz bandwidths
  - PTP 820G - Added adaptive transmit power for ACM
  - Removed support for 2048 QAM as a fixed mode and updated other allowed modulations
  - Updated XPIF and DFM parameters
- PTP 820
  - Added remote mount option and additional antennas
  - Added new FCC regulations at 7 and 13 GHz
  - Added new Canadian regulation at 8 GHz
  - PTP 820S - Added 7 and 8 GHz frequency bands
  - PTP 820G - Added 10 and 20 MHz bandwidths to 7 GHz NTIA regulation
- ePMP
  - Added Force 200 at 5 GHz as SM and PTP options
- PTP 650 - Release 01-41
  - Added Japan Low Power at 4.9 GHz

- Added Australia at 4.9 GHz
- Increased maximum range to 250 km
- PTP 700
  - Added Australia at 4.9 GHz

### ***Bug Fixes in version 4.3.7***

- Re-instated regional based optional extras on PTP 650
- Fixed bug that was duplicating BOM estimates when copying links

### ***New or Changed in version 4.3.6***

- ePMP
  - Added AP Lite parts to Optional Extras
  - Added additional South African Development Community countries
- PMP/PTP 450/450i Rel 14.1.1
  - Added interoperability for PMP between PMP 450 Access Points and PMP 450i SMs and between PMP 450i Access Points and PMP 450/450d SMs
  - Added 5.1 and 5.2 GHz bands for Mexico and 'Other'
  - Added 4.9, 5.1, 5.4 and 5.8 GHz bands for 'Other - ETSI'
  - Updated sensitivity levels for PMP/PTP 450i - note that this will change predicted performance levels from earlier versions
  - Extended the 3.6 GHz 'Other' regulatory band to 3500 - 3800 MHz
  - Added High Gain Integrated Antenna option for 3.x GHz bands
  - PMP 450i 900 MHz - Added 20 MHz bandwidth
- Updated Installation Reports to give separate sections for Installation and Commissioning
- Added a Full BOM page to the main BOM Export to Workbook
- Added LINKPlanner version number to both the BOM Export from the main project and the Estimator.
- Limit the precision of the range, height and obstruction values when exporting the profile to a CSV file so that it reflects the precision used inside LINKPlanner

### ***Bug Fixes in version 4.3.6***

- Fixed default cable losses on AP and SM antennas
- Fixed an error with Channel Plans for ePMP Force 180 and 200

- PTP 820 – changed the band edge channel selection to use the occupied bandwidth
- PTP 820G - correct the capacity license key for 60 MHz at 128 QAM from 300 to 500 Mbps
- PMP 450/450i – corrected error in throughput calculations for 10 MHz when the Maximum Range was either 25 or 34 miles.
- PTP 700 - updated the throughput calculation in line with product changes, resulting in slightly reduced throughput rates.
- Corrected upper frequency limits for ePMP 2.4 GHz and 5.9 GHz, changes centre frequency for PTP links, which impacts fade margin calculations and hence availability and throughput, especially for Force 180 and Force 200.
- Fix error when creating a PTP600 link with E1/T1
- Add the 250 kilometer ranging mode for PTP700
- Prevent errors creating a new PMP BOM Estimate after previously removing all of the estimates
- Prevent the mouse-wheel scroll event from propagating out of the offline map
- Corrected the AP Performance Summary table, which did not show the correct number of SMs on the DL end when the SMs used a different product
- Fix bug which prevents the license from being edited through the links table

### ***New or Changed in version 4.3.5***

- New Feature - Added PMP support to BOM Estimator Tool.
- ePMP
  - Added Force 180 at 5 GHz and Force 200 at 2.4 GHz as SM and PTP options.
  - Added ePTP option in DFS regions.
- PMP 450i
  - Added 900 MHz Frequency Band at 5, 7 and 10 MHz bandwidths.
- PTP 700
  - Added Lite capacity option.
  - Increased maximum range to 250 km.
- Remove the Google Earth view on 12 December 2015 when Google stop the service.

### ***Bug Fixes in version 4.3.5***

- Fixed bug which was creating additional APs when opening a project with the Prediction Model set to Vigants-Barnett.
- Fixed PMP 450i AP line cord options in the BOM optional extras.
- PMP 450 SM ACPSSW-xx power supplies are now obsolete, replaced by N000900L001.
- Added 11 GHz Taper Transition back into the default BOM for PTP 800 ODU-A Long Waveguide.
- Fixed error to restrict single payload modes to Highest Mod Mode on PTP 650 and PTP 700.
- Fixed subscriber BOM aggregation issue for items with no part number.
- Note - some PTP 650 ancillary part descriptions have changed to become more generic, where the products are now being used across multiple products.

### ***Bug Fixes in version 4.3.4***

- Fixed error with rule formatting for 1+1 and 2+0 links

### ***New or Changed in version 4.3.3***

- New Feature - Availability calculations for PMP Link Performance and ability to define Required Availability
- New Feature - PMP Link Formatting Rules
- PMP/PTP 450i
  - Updated BOM with additional parts and added more to Optional Extras
  - Added Industry Canada part numbers
  - Removed Preliminary from Brazil and Mexico for PTP 450i
- PTP 650
  - Removed Mid Capacity option (all Mid Capacity users can now upgrade for free to Full)
- PTP 700
  - Updated transmit powers and sensitivity values, this will show a degradation on predicted performance for most links from the previous version.
  - Added Industry Canada part numbers
  - Removed Preliminary from FCC countries for 4.5 and 4.9 GHz

- PTP 820
  - Updated 1+1 BOM for PTP 820C and PTP 820S to remove PoE and add Optical Fibre support
  - Added additional 3ft antennas to APAC and EMEA region
  - Added 60 MHz bandwidth to Lower 6 GHz FCC for 2+0 ACAP and ACCP
  - Added Warranty part numbers to Optional Extras
- Obsoleted PTP 250, 500 and PTP 600 products (except at 4.5 and 4.8 GHz)

### ***Bug Fixes in version 4.3.3***

- Fixed error when calculating cable lengths in the BOM, which was over-predicting the amount of cable required in some cases
- Differentiate between PMP azimuth and tilt angle error indication when bearing is out of range
- Add additional explanatory notes to BOM items for PTP-SYNC for PTP 650 and PTP 700 and PoE Injector for PTP 820C and updated other notes on the BOM
- Prevent the "Test profile service" from returning successful when username or password are incorrect

### ***New or Changed in version 4.3.2***

- New Feature - PMP Equipment Templates to define AP Equipment types
- New Feature - BOM Estimator Tool for PTP
- ePMP 1000
  - Added support for 4.9 GHz in PTP mode
  - Added 2.5 ms Frame Period
  - Added PMP 450 60 and 90 degree antennas as options to the AP
  - Modified sync options from CMM to CMM3 and CMM4
- PTP 820
  - Added PTP 820C 2+0 SD
  - Added 15 GHz Canadian Regulation
- PMP/PTP 450i
  - Added PMP 450 60 degree antenna to AP option list
  - Added Mexico in 4.9, 5.4 and 5.8 GHz
  - Updated regulations for 5.8 GHz for all PMP countries and 4.9 GHz and 5.8 GHz PTP in Brazil

- PMP 450
  - Extended Downlink Data range to 15 - 75% for North America region at 5.4 GHz
- Unlicensed Band
  - Added antenna patterns for all Cambium unlicensed external antennas to the Save Antenna Pattern feature
  - Added PTP 450i to FCC/IC Antenna Approval warning list and updated list for PTP 650 and 700
- Updated Installation Reports for PMP/PTP 450, PMP/PTP 450i and ePMP, including adding Frequency Carrier information

### ***Bug Fixes in version 4.3.2***

- Fixed bug that prevented Channel Plans from being edited
- Corrected part numbers for PMP/PTP 450i radios in Bill of Materials and updated brackets and optional extras
- Removed capability to define an AP antenna from Hub Level
- Corrected throughput for Lowest Ethernet mode when used in conjunction with TDM for PTP 600, 650 and 700.
- Fixed issue with corruption of config file when there is no access to internet

### ***New or Changed in version 4.3.1***

- Change the power supply for PTP 820S. It now uses the same power supply and surge suppressor as PTP 650.
- Add PMP/PTP 450i to the configuration file export.

### ***Bug Fixes in version 4.3.1***

- Correct issues with the PTP 820 coupler losses.
- Fix quantities and parts for PTP 820 mediation devices in the BOM.
- Fix issues when editing the product or license across multiple links in different bands.

### ***New or Changed in version 4.3.0***

- Added support for PMP/PTP 450i at 4.9, 5.4 and 5.8 GHz
- Added support for PTP 700 including 4.5 GHz band



- Added the Worst Earth Curvature, Ke and Excess Path Loss at Ke to the Climatic Factors section of the Proposal Report
- Added Malaysia to PMP 450 at 5.8 GHz

### ***Bug Fixes in version 4.3.0***

- Removed FCC antenna warning from PTP 250, 300, 500 and 600 products
- Limited PTP 820 14 MHz bandwidth to Profile 9 (removed 2048 QAM mode)
- Moved PTP 820 Outdoor Fiber Distribution Closure Splitter to Optional Extras from 1+1
- Prevent the "Access is Denied" error when saving a project file on Windows

### ***New or Changed in version 4.2.8***

- Added support for PTP 820 Release 8.0:
  - PTP 820G 1+1 Spatial Diversity (select 1+1 Hot Standby and then Spatial Diversity in Antenna Configuration)
  - PTP 820G - added 10 and 20 MHz bandwidths
  - PTP 820G - added 2048 QAM support for bandwidths above 14 MHz
  - PTP 820G - added XPIC support for 50 and 60 MHz
  - PTP 820C and PTP 820S ACM now supports adaptive transmit power
  - PTP 820C - added support for 7 and 14 MHz on 2+0, including XPIC and MC-ABC
  - PTP 820C and PTP 820S transmit power at 13 GHz, 256 QAM reduced from 22 to 20 dBm
- PTP 820C New Frequency bands:
  - Removed Preliminary from 26 and 38 GHz
  - Added 28 GHz ETSI
  - Added 11 GHz ETSI T/R 530 MHz
- PTP 820G New Frequency bands:
  - Added 26 GHz (ETSI and FCC), 28 GHz (ETSI), 32 GHz (ETSI) and 38 GHz (Canada, FCC and ETSI)
- PTP 820S New Frequency Bands:
  - Removed Preliminary from Upper 6 GHz and 15 GHz
  - Added 13 and 28 GHz ETSI
  - Added 11 GHz ETSI T/R 530 MHz

- Added 200 and 300 Mbps capacity keys for PTP 820G and PTP 820S and 300 Mbps for PTP 820C
- Added PTP 820 NMS parts under Optional Extras in the BOM
- Consolidated 11 GHz to use the T/R 490/500 parts, may result in a change of part number for PTP 820G when using T/R 530 MHz
- PTP 820 - 11 GHz, added Canadian compliance to Andrew 4ft antennas
- Added the `Worst Earth Curvature`, Ke and Excess Path Loss at Ke to Licensed Band Pop-up information window and PTP Links view
- Added new Project Property to define Sector Coverage, allows PMP 450 to be restricted to nominal beamwidth

### ***Bug Fixes in version 4.2.8***

- Fixed issue with PTP 650 Lowest Telecoms Mode not working
- Reinstated Force 110 antenna option for ePMP Subscriber Modules
- Corrected the coordinates displayed in the PMP reports
- Added capability to include user defined parabolic antennas which can be selected for the United States (Parabolic) regulations at 5 GHz
- Updated BOM parts list for PTP 820C and PTP 820S 1+1 configurations
- Convert obstruction heights to 0 if the user tries to import negative obstruction values using copy/paste

### ***Bug Fixes in version 4.2.7***

- Prevent error when deleting an Access Point in the project tree
- Fix save errors when the user name contains Unicode characters

### ***New or Changed in version 4.2.6***

- Added support for PMP 450d Subscriber Module at 5 GHz
- Added ability to define PMP channel plans, allocate channels to APs and color code the sectors in the Offline Map
- Improved the reflection editor for licensed band
- Added Proposal reports at PMP Network, Hub and AP levels
- Added additional notification to PTP 650 5.1 GHz FCC for Parabolic antennas
- Added capability to automatically create required custom fields for FCC 3.65 GHz Device Registration

- Added the capability to save antenna pattern files stored in LINKPlanner
  - currently only supports licensed band antennas.
- Added confirmation setting when converting linked sites
- Added 3, 4 and 6ft Radiowaves antennas at 6 GHz for PTP 820 in NA and CALA.
- Added bearing from boresight and indication of direction of tilt for Subscriber Modules.

### ***Bug Fixes in version 4.2.6***

- Add 5 and 10 MHz to Ecuador for ePMP at 5.1 GHz
- Corrected missing MC-ABC option for PTP 820C Narrow at 80 MHz
- Corrected error on PTP 820C 38 GHz links when adding external interference
- Fixed error in embedded Google Maps when using the select pointer
- Added handling of read errors when requesting path profiles
- Disabled write caching when saving project files (e.g. to prevent errors when saving to USB drives).

### ***New or Changed in version 4.2.5***

- Added the ability to plan 80 MHz bandwidth links using PTP 820 narrow radios, this results in lower capacity than using the PTP 820 wide radios.
- Added PTP 820 sub-band prioritization to reduce the number of sub-bands for single frequency links.
  - This may change the sub-band for some links in existing projects, existing sub-bands are still valid
- Added the AP Lite parts to the Optional Extras for PMP 450
- Added a Summary table to the Access Point Installation Reports
- Added the capability to export the project level BOM to a single Excel Workbook with each PTP link on a separate sheet
- Added an export file with the FCC device registration information for PMP/PTP 450 3.65 GHz devices
- Added bearing to magnetic north and magnetic declination information to installation reports
- Offline Map enhancements
  - Pop-out overlapping sites in the offline-map to make them easier to select
  - Edit a hub from the AP pop-up menu

- Hide/Show items in the map
- New selection window to hide, show, copy, delete multiple items
- Added ability to control whether profile previews appear in the Google Earth Export
- Added a search bar to the main toolbar to make it easier to locate items in the tree
- Added "Show in map" menu item to the navigation tree pop-up
- Performance improvements when opening large PMP projects
  - Note: Projects will need to be saved in the new version first.
- Obsolete Gabriel antennas

### ***Bug Fixes in version 4.2.5***

- Added support for adjacent 30 MHz bandwidth channels in FCC Lower 6 GHz for PTP 820 (actual separation is 29.65 MHz)
- Made AP name unique when copying and pasting APs into the same project and allow reports to be created with duplicate AP names
- Updated frequency stability and wide bandwidth Ttol curves for PTP 800 and PTP 810 PathLoss equipment files
- Added support for Brazil power supply cords in the PTP 450 options

### ***New or Changed in version 4.2.4***

- Added additional map features to the context-sensitive map:
  - Create Hubs and APs from a Network Site
  - Attach subscribers to an Access Point
  - Edit items without leaving the map
- Automatically set the azimuth when creating a new Access Point

### ***Bug Fixes in version 4.2.4***

- Remove SM equipment choices from PMP 450 AP view
- Add 5.4 GHz US TDWR Radar warning in PMP mode
- Change ePMP Enhanced PTP mode to ePTP mode
- Fixes for KML/KMZ export
  - Remove hyperlinks

- Update the Subscriber Site profile preview to only show links to unattached Access Points

### ***New or Changed in version 4.2.3***

- Support ePMP System Release 2.4
  - Add Enhanced PTP Mode
  - Add Maximum Mod Mode configuration for AP and SM
- Additional PTP 820 functionality
  - PTP 820C
    - Support for greater than 1 Gbps throughput on 2+0 link types
    - Preliminary support for 26 and 38 GHz ETSI and 38 GHz FCC & Canada
    - Increased 7 MHz bandwidth to 1024 QAM (Profile 9)
    - Increased 14 MHz bandwidth to 2048 QAM (Profile 10)
  - PTP 820G
    - 11 GHz ETSI
  - PTP 820S
    - 2+0 Co-Polar and 2+0 Cross-Polar capability
    - 7 (to 1024 QAM (Profile 9) and 14 MHz (to 2048 QAM Profile 10) bandwidth options
    - Preliminary support for 15 GHz ETSI
  - PTP 820C and PTP 820S
    - 80 MHz bandwidth at 11 GHz ETSI
    - 1m Protection Cable added to BOM for 1+1 link types
  - PTP 820C and PTP 820G
    - 56 MHz bandwidth at 13 GHz ETSI
  - PTP 820C, PTP 820G and PTP 820S
    - Removed antenna availability warning for 6 ft Global antennas
- Improved PMP Reports with new Installation reports at AP and Hub level
- Added sample external SM antenna options for PMP 450 to each frequency band.

### ***Bug Fixes in version 4.2.3***

- Corrected display of PTP Link Custom Field in the PTP Links view

- Corrected issue when starting LINKPlanner without contact to the path profile server
- Corrected problem with applying Equipment templates which contain configured frequencies
- Updated country lists to correctly include 4.9 GHz for non-US FCC countries
- Corrected refresh issue in the BOM when changing PTP 800 capacity keys
- Apply the display style correctly when the project contains multiple formatting rules

### ***New or Changed in version 4.2.2***

- Support PMP/PTP 450 System Release 13.2 and 13.3
  - Add MIMO-A modulation modes to PMP 450
    - This updates sensitivity levels for all modulation modes
  - Add 7 MHz Bandwidths for PTP/PMP 450
  - Add ability to select Frame Period for PTP/PMP 450
  - Removed Canada Lower from 3.6 GHz (supported on 3.5 GHz units), renamed Canada Upper to Canada
  - Added an export capability to provide configuration files
- Support ePMP System Release 2.2 to 2.3.4
  - Add MIMO-A modulation modes
    - This updates sensitivity levels for all modulation modes
  - Added 5 and 10 MHz bandwidth options in PMP mode
  - Add SM Tx Power Manual Limits to reports as required
  - Updated regulatory information for multiple countries
- Support System Release PTP 650 01-40
  - Added 3:1 and 5:1 symmetry options
  - Updated regulations for Indonesia (5.8 GHz), India (5.8 GHz) and Brazil (4.9 GHz)
  - Added 45 MHz bandwidth option to 5.4 GHz ETSI countries
  - Added new regulatory options for FCC countries for links using Parabolic antennas
- Updates to Map Features
  - Clicking hyperlinks now takes users to the links part of the Navigation Tree
  - Allow users to display SM names on PMP map in the installation report

- Updated graphics preferences to include PMP links
- Map display at site level zooms to centre on selected site
- Added ability to remotely update data files
- Add a field to record the MAC Address for the ends of a link, AP or SM
- Display a warning when the number of SMs exceeds the SM Registration Limit

### ***Bug Fixes in version 4.2.2***

- Updated PathLoss import formats with respect to changes in PathLoss file formats
- Fixed MAC CHM link
- Fixed issue with preserving User Limits when switching between 2+0 Link Types
- Fixed error when reversing a link on 1+1 licensed band links
- Updated PTP 650 reports to exclude reduced installation receive level on short links
- Fixed error when trying to switch to TDD Sync enhanced mode
- Cancel profile requests when closing a project or deleting links
- Prevent duplicate profile requests when pasting links into a project

### ***New or Changed in version 4.2.1***

- Added support for ePMP 1000 in PTP mode
- Added high level Mean Predicted Throughput for ePMP 1000 AP
- Updated PTP 820 Part Descriptions
- Updated Optional Extras for PTP 450 and PTP 820
- Removed EIRP limit from PTP 450 Canada, FCC and Other-FCC at 5.8 GHz
  - For existing projects please check that the correct country option is selected.

### ***Bug Fixes in version 4.2.1***

- Fixed issue when creating SM custom antenna
- Fixed PTP 800 and PTP 810 Installation Report issues
- Prevent site coordinates from being changed on sites that have PMP links

### ***New or Changed in version 4.2.0***

- Added support for PTP 450
- Added high level Mean Predicted Throughput for PMP 450 AP
- Added Global SM Height value to the Project Properties
- Enabled option to select paper size when exporting a map as a PDF

### ***Bug Fixes in version 4.2.0***

- Changed PTP 820S Upper 6 GHz to Preliminary
- Modified PTP 820 80 MHz capacity key requirements and removed 1024 QAM option for 2+0 links with 80 MHz bandwidth
- Removed modulation modes above 512 QAM for 7 and 14 MHz for PTP 820C
- Removed 7 and 14 MHz options from 2+0 link types for PTP 820C
- Added warning about availability of Commscope 6ft antennas for PTP 820
- Added LPU to PTP 820G automatic Bill of Materials and additional Optional Extras
- Changed Edge-CET-Node licenses to a quantity of 2 rather than 4, for 820G 2+0 configurations
- Removed Canadian 310.5 compliance from Andrew 3ft 11 GHz for PTP 820
- Fixed Capacity and Throughput values in Aggregate Proposal Reports for 810 and 820
- Fixed rounding errors in 820G XPIC capacity calculations, minor change to reported values
- Removed "Other" option from Antenna selection list for PTP 820
- Increased 5.8 GHz upper frequency limit, this may make a minor change to fade margin and availability for some regulations.

### ***New or Changed in version 4.1.2***

- Added support for PTP 820G for 1+0, 1+1, 2+0 Cross-Polar, 2+0 Co-Polar and 2+0 XPIC in the following bands:
  - Lower 6, Upper 6, 7, 8, 11, 13, 15, 18 and 23 GHz
- Added support for 7 and 14 MHz for 820C for all Link Types except 2+0 XPIC

### ***Bug Fixes in version 4.1.2***

- Fixed issue with re-ordering, sorting and deleting columns in table views



- Fixed issue with renaming of 2+0 XPIC links
- Fix bug when double-clicking on a 2+0 XPIC link in the map
- Fixed display of E1/T1 in PTP 810 2+0 Aggregate Performance Details
- Fixed issue when creating equipment templates from an existing 1+1 link
- Fixed issue applying equipment template optional extras
- Fixed error when changing the sites on a 2+0 PTP link

### ***New or Changed in version 4.1.1***

- Added support for PTP 820C 2+0 configurations
- PTP 820 "Global" antenna now default option

### ***Bug Fixes in version 4.1.1***

- Corrected refresh issues on PTP 810 2+0 Aggregate page
- Prevented error when changing from licensed to unlicensed frequency bands when on a child link on PTP 820
- Removed 28 MHz BW from PTP 810 8 GHz 126 T/R spacing as no valid frequency pairs
- Reinstated ODU-B as default option for PTP 800/810
- Round TDD Frame Offset to nearest integer to match product data entry

### ***New or Changed in version 4.1.0***

- Support for PTP 820 1+0 and 1+1 link types in the following bands
  - PTP 820C at Lower 6, Upper 6, 7, 8, 11, 13, 15, 18 and 23 GHz
  - PTP 820S at Lower 6, Upper 6, 11, 18 and 23 GHz

### ***New or Changed in version 4.0.3***

- Added support for FCC, Other-FCC and Canada Lower and Upper in 3.6 GHz band for PMP 450
- Added support for Japan at 4.9 GHz and Slovenia at 5.8 GHz for PTP 650
- Added option to specify Required Modulation Mode on PMP links - links which don't meet this will go red
- Added ability to import PMP Links from a csv file - see User Guide for format details

- Added additional information into Available Antenna lists to specify product and part numbers for SM additions.
- Added regulatory frequency ranges to PMP Links in the Installation Reports
- Added PMP Product Software Release version information to Installation Reports.
- Updated displayed antenna description for Force 100 antennas for ePMP

### ***Bug Fixes in version 4.0.3***

- Fixed issue preventing Google Earth Export when project only contains PMP Links
- Fixed issue with "red line" on path profile not updating when AP Height changed
- Fixed issue with contents listing in HTML Help file
- Fixed issue on downlink with transmit power not backing off correctly in 256QAM and QPSK - SISO for PMP 450 at 3 GHz
- Fixed issue importing multiple Pathloss profiles.

### ***New or Changed in version 4.0.2***

- Added a Performance Summary for each Access Point, which collates the Maximum Modulation mode for all PMP Links
- Removed "Preliminary" from PTP 650 5.1 GHz for United States and other FCC countries
- Updated ePMP Force 100 part descriptions
- Improved PMP Links view to ensure header line stays visible
- Added improved functionality to PMP Links when exported to Google Earth

### ***Bug Fixes in version 4.0.2***

- Fixed an issue to ensure link formatting rules hide links in map view when requested
- Corrected ePMP SM Maximum Transmit Powers for 5.4 and 5.8 GHz
- Removed ePMP Mounting Bracket from integrated antennas or where provided
- Fixed an issue when creating installation reports with PTP 810i 1+1 and 2+0 links
- Prevented copy function creating duplicate Access Points
- Fixed issues when creating and saving custom SM antennas
- Removed extra dish antenna from BOM when selecting Force 100

- Added distance markers back in to PTP 1+1 and 2+0 link export to Google Earth

### ***New or Changed in version 4.0.1***

- Add the ability to save a project in the v3.x.x format
  - Any new features will be lost from the file
- Include the number of PMP links in the project summary information
- Add the option to create a new custom antenna from the Subscriber Module antenna selection list

### ***Bug Fixes in version 4.0.1***

- Fixed errors when double-clicking an item in the Offline Map
- Fixed errors when copying equipment templates and rules
- Fixed errors with the new PMP link dialog
- Fix a bug which prevented the creation of a custom antenna from the unlicensed band antenna list
- Fixed non-ASCII character problems
- Stop the Subscriber Modules from requiring recalculation when the Access Point changes do not impact the link (such as name, description)
- Refresh the PMP link performance summary when the Subscriber Module changes
- Fix errors when deleting PMP Objects

### ***New or Changed in version 4.0.0***

Note that projects saved in this version of LINKPlanner **CANNOT** be opened in V3.x.x versions of LINKPlanner.

- Support for the PMP 450 product in 2.4 GHz, 3.5 GHz, 3.6 GHz, 5.4 GHz and 5.8 GHz bands
- Support for the ePMP product in 2.4 GHz, 5.1 GHz, 5.2 GHz, 5.3 GHz, 5.4 GHz and 5.8 GHz bands
- The Flags functionality in PTP has been removed and combined into the Custom Fields functionality. All existing Flag settings will now be available through Custom Fields.

### ***New or Changed in version 3.6.6***

- Support system release PTP 650 01-20

- Add TDM Support including Network Indoor Unit (NIDU) provision in the BOM
- Add PTP 650 MAB License and PTP 650 Group Access License to Optional Extras
- Add Hungary (Rural) at 5.8 GHz
- Add Guam, Puerto Rico, United States, US Virgin Islands at 5.1 GHz as Preliminary

### ***Bug Fixes in version 3.6.6***

- Correct the capacity and Precise Network Timing license entries in the BOM when using external antennas on PTP 650.

### ***New or Changed in version 3.6.5***

- Support system release PTP 650 01-10
  - Add PTP 650S through selection of Small Form Factor antenna (only available with Full capacity key)
  - Introduce TDD Sync for PTP 650 - introduced new TDD Sync Offset calculation option for all products
  - Add new RoW kit part numbers with US line cord option
  - Split 5.2 GHz into separate 5.1 and 5.2 GHz Frequency Bands
    - Note: this moves ETSI BBDR from 5.2 GHz band to 5.1 GHz band
  - Remove preliminary from 5, 15 and 30 MHz bandwidths
    - Note: slight adjustments to sensitivity figures across all bands and bandwidths may change availability
  - Change to Minimum Platform Transmit Power (from -11 dBm to -15 dBm)
  - Added Precise Network Timing option for license key for 1588 and Sync-E
    - Note: this license is added as default to PTP 650S
- Regulatory changes for PTP 650
  - Removed "Preliminary" from Argentina, Brazil, Chile, Oman, South Africa and Vietnam
  - Added Saudi Arabia (5.8 GHz), Brazil (4.9 GHz)
  - Removed "Preliminary" from Other at 5.1, 5.2 and 5.9 GHz and Other + Radar at 5.2 GHz
  - Added new countries to 5.1 and 5.2 GHz as "Preliminary"
  - Provided two regulatory options for Argentina (Private and Telecoms)

- Added new unlicensed Cambium antennas RDG4472, RDG4452, RDG4454
- Added new PTP 810 Series NMS AES License Key to Optional Extras – Security
- Removed the obsolete Summit X250, X350 and X440-L2-24t-AC switches
- Removed GPS Receiver as independent part - now only available as part of kit WB4141
- Replaced 6406066M02 with N000000L019 for use with the "All Indoor" ODU mounting.

### ***Bug Fixes in version 3.6.5***

- Correct the data rate calculations for PTP 650 at 40 and 45 MHz bandwidths. This may increase or decrease the data rate seen in previous versions depending on the range of the link. Very short links are unaffected.

### ***New or Changed in version 3.6.4***

- Regulatory changes for PTP 650
  - Removed "Preliminary" from Canada (4.9, 5.4 and 5.8 GHz) and United States (5.4 GHz)
  - Added United Arab Emirates (5.4 and 5.8 GHz)
  - Added 4.9 and 5.2 GHz for Other and 5.2 GHz for Other + Radar as "Preliminary"
  - Changed 5.9 GHz Other to "Preliminary"
- Added intermediate cable grounding kits for IRFU and long waveguide to the BOM for PTP 800 and PTP 810, for antenna heights greater than 23m

### ***Bug Fixes in version 3.6.4***

- Correct the PTP 810 1+1 Frequency Diversity BOM
  - Fix item quantities and some IRFU and antenna part numbers for IRFU configurations
- Corrected vertical scale issues in offline map
- Fixed copy/paste links issue which resulted in duplicate sites if using sub-band B4 or B5 ODUs in Lower 6 GHz band
- Fixed issue with saving flag parameters and interaction with link formatting
- Fixed issue when sizing the warning panel which resulted in an error message

### ***New or Changed in version 3.6.3***

- Added note to BOM to identify some Extreme Summit Switches which are obsolescent
- Changed "password" to "access token" in Web Profile registration to avoid confusion with Cambium Support web portal password
- Added intermediate cable grounding kits to the BOM for PTP 650, 800 and 810 for antenna heights greater than 23m
- Removed "Preliminary" status for PTP 650 in Australia and New Zealand, added 5.4 GHz for New Zealand

### ***Bug Fixes in version 3.6.3***

- Changed default SKU for Canada from FCC/IC to RoW
- Restricted EIRP to 24 dBm at 45 MHz for 5.2 GHz in Regulatory Band 38 (FCC countries)
- Removed 2-port distribution manifold from default BOM when using the Dryline Dehydrator

### ***New or Changed in version 3.6.2 (limited release)***

- Update the warning when the selected antenna is not approved for FCC/IC to include 4.9 GHz and 5.2 GHz
- Round the data rate calculation for PTP650 Lite/Mid to the nearest Mbps
- Update the max EIRP values for Canada, United States and Hong Kong at 4.9 GHz
- Update the license availability for PTP650

### ***Bug Fixes in version 3.6.2 (limited release)***

- Maintain the Highest Modulation Mode when switching between Single/Dual Payload
- Display the correct project name after saving with a new filename
- Remove ODU RMK, Flex Waveguide Hangers and LPU End Kit from Long Waveguide default BOM
- Refresh the map after clicking the "Show the sites without links" button

### ***New or Changed in version 3.5.5***

- Support system release PTP 800-06-00

- Remove Preliminary status for 60 MHz bandwidth at Lower 6 GHz and 80 MHz at 11 GHz for FCC regulation.
- Introduce sub-band B4 and B5 ODUs for Lower 6 GHz.
  - Note: These overlap existing B1, B2 and B3 sub-bands, when opening old projects the BOM may update the selected ODUs.
- Remove capability to request path profiles via email
- Apply Frequency Separation limits to common port T/R spacing on 2+0 and Frequency Diversity configurations using ODUs for both PTP 800 and PTP 810
  - Note: This change means that 2+0 and Frequency Diversity cannot be supported for all combinations of T/R spacing and frequency band
- Retire remaining PTP 400 product line
- Add additional Cambium part numbers for unlicensed antennas
- Obsolete Commscope Flat Panel Unlicensed antennas
- Add EWP52 and EWP63 waveguide types to unlicensed cable selection
- Updated IRFU extras for PTP 810

### ***Bug Fixes in version 3.5.5***

- Prevent automatic request of profile when pasting profile from another project, to maintain any previous edits.
- Maintain map zoom level in Offline map when switching windows
- Prevent user-defined antenna reverting to integrated on bandwidth changes
- Allow multiple editing on Sites page
- Remove default ODU part numbers as standard, feature can be enabled from Options - Bill of Materials - Add default ODUs.
- Update the font cache to prevent errors when the font name contains Unicode characters
- Disable path profile requests for very short links (< 10m)
- Fix the bug "Observable tries to pop from the EventCollection when the collection" raised by a number of users

### ***New or Changed in version 3.6.1 (limited release)***

- Reduce QPSK to 64QAM power levels by 1 dB for PTP 650
- Update the "Other" and "Other + Radar" license definitions
- Remove mounting bracket from the PTP650 BOM

***New or Changed in version 3.6.0 (limited release)***

- Support for the PTP 650 unlicensed product in 4.9 GHz, 5.2 GHz, 5.4 GHz, 5.8 GHz and 5.9 GHz bands

***New or Changed in version 3.5.4***

- Introduced Preliminary support for 60 MHz bandwidth at Lower 6 GHz and 80 MHz at 11 GHz for FCC regulation.
- New 5.4 and 5.8 GHz licenses for Vietnam for PTP 600
- New 5.8 GHz license for Indonesia for PTP 600
- Add Uncoupled IRFU Transceivers to optional extras
- Add end warranties and new UC-APL parts to optional extras for PTP 600
- Automatically add coaxial cable hoisting grips to BOM
- Changed link order in reports to reflect displayed link order in LINKPlanner
- Added capability to allow link formatting rules to identify LOS, nLOS and NLOS links

***Bug Fixes in version 3.5.4***

- Apply Equipment Templates when using “Create links from this hub”
- Prevent splash screen from staying on top during start-up
- Fixed PTP 810 refresh errors when changing product or link types
- Fixed issue with link formatting rules on PTP 810 2+0 links
- Updated HP/SP nomination of 6 and 11 GHz antennas
- Limited TDD Sync burst duration options for PTP 500 to those available in product
- Correctly handle Unicode characters when displaying the pop-up availability report
- Prevent errors when calculating the terrain roughness and all of the terrain heights are set to the same value

***New or Changed in version 3.5.3***

- Updates to the embedded Google views:
  - Option to display the site labels
  - Option to preview the path profiles for existing links and between nearby sites



- Add support for Indonesia at 5.8 GHz for PTP 500

### ***Bug Fixes in version 3.5.3***

- Fix a bug with the automatic path profile requests when the user name or company name contain non-ASCII characters
- Fix error when editing BOM quantities
- Minor updates to part descriptions and optional extras

### ***New or Changed in version 3.5.2***

- Add support for STM-1 in PTP 810 by including a new TDM configuration panel for STM-1 and E1/T1
  - Existing PTP 810 links, TDM and MMU Model settings may no longer be valid and will be reset to default values with a user warning
- Add support for Enhanced Standard Master I/O module and additional modules to support STM-1 for PTP 810
- Introduced 3 variants of the GigE model to show different capabilities of the 3 FPGA options
  - Existing projects will default to GigE "J" where available, with a user warning
- Add support for 15 GHz NTIA band for PTP 800 including new ODUs
- Add end warranties to PTP 250 and PTP 500
- Reduce the restrictions on IRFU antenna selections
- Add Upper 6 GHz 4ft Cat B2 dual polar antenna option
- Add default lengths (10m or 30ft) to elliptical waveguide lengths for:
  - Distance to shack
  - Distance inside shack
- New 5.4 and 5.8 GHz licenses for Vietnam for PTP 250 and PTP 500
- New 5.4 GHz licenses for PTP 250
  - Serbia and Mexico
- New Summit Extreme switches available for all products as Optional Extras in the Bill of Materials

### ***Bug Fixes in version 3.5.2***

- Reduced maximum receiver power for PTP 300 and PTP 500 from -45 dBm to -51 dBm. This increases the minimum range at which links which don't have Radar enabled can be supported
- PTP810 optional extras moved from "Accessories" to either "Power" or "Cable, Accessories & Spares" sections, as for other products
- Stopped screen scrolling when adding extras to the BOM
- Fix a bug with the link formatting rules which appears if the user deletes a link whilst the rules are being processed
- Fix bug with the Google Map view which prevented the information balloon from appearing when selecting a link or site

### ***New or Changed in version 3.5.1***

- Include default project templates for the Vigants-Barnett/ITU-R prediction model settings

### ***Bug Fixes in version 3.5.1***

- Correctly display links that cross 180 degrees longitude in the maps
- Fix encoding error when displaying the sales contacts
- Fix bug with the installation report when a table wraps over 3 pages
- Correct error with the prediction model settings for protected links
- Fix bugs that occur when applying equipment templates to protected links, particularly when the template is for a different link type
- Prevent error when copying an antenna without a part number
- Fix bug with 1+1 Hot Standby links where the interference value would be set incorrectly when loading an existing file

### ***New or Changed in version 3.5.0***

- Introduction of web path profile service
  - Profiles entered straight into LINKPlanner project - no more emails
  - Option to automatically request profiles when a new link is created
- Display the appropriate Cambium contact information for links and projects
- Introduction of PTP 810 1+1 Frequency Diversity
  - Not allowed in FCC regions

- Support for different MMU Modems for PTP 810 at each end of link
- Support for Brazil regulation at 18 GHz for PTP 810
- Support for APC for 2+0 XPIC (allows 2+0 XPIC to be used at 18 GHz in ETSI region)
- Introduction of licensed band Hi/Lo site nomination - with default ODU part numbers put into BOM
  - This feature restricts frequency selection at an end to be compliant with site designation
- Enhanced Equipment Templates to include Performance Summary parameters
- Modified setting of Prediction Model to make it project based and not user based
  - Check model setting when first opening existing projects after upgrading
  - Prediction Model setting is stored in project templates
- Removed preliminary status from PTP 250 countries
  - Add Switzerland and Liechtenstein to 5.4 GHz band
- Add ability to create a ring of links on the offline map view

### ***Bug Fixes in version 3.5.0***

- Fixed screen refresh problem on Windows Vista and Windows 7 when using the Classic Theme
- Rounding down of PTP 810 GigE capacity figures for values below 100 Mbps
- Limited Diversity Improvement Factor to 200 in calculations as well as reports
- Removed 7 GHz FCC 25 MHz IRFU 2+0 XPIC option

### ***New or Changed in version 3.4.0***

- Introduce support for IRFU to PTP 810, including 2+0 Cross-Polar and 2+0 XPIC
- Add support for alternate T/R spacings on ODU's for PTP 810
- Add support for Super PDH Master I/O Module for PTP 810
- Add 21 x E1/T1 Expansion Module to optional extras for PTP 810 BOM
- Add support for NTIA with PTP 810 at 7 and 8 GHz
- Introduce capability to adjust frequency step size for IRFU to allow smaller rasters
- Expanded antenna selection for FCC at 6 and 18 GHz to include Cat B2 in line with FCC-12-87 rule change
- Add Cambium part numbers for unlicensed antennas

### ***Bug Fixes in version 3.4.0***

- Update of unlicensed antennas, resulting in:
  - A change of frequency specification for some antennas, which may no longer be available at 5.4 or 5.9 GHz.
  - A slight change in antenna gain, the majority increasing by ~0.25 dB, which may result in a slight change in predicted availability and data rate.
  - Links which included antennas that are no longer valid will be reset to the default antenna with a user warning.
- Fix error which prevented feeder losses being applied from equipment templates to new links
- Ensure that changes to availability requirements for 1+0 are preserved if Link Type is changed.
- Update "Missing Information" message when entering Personal Information, so that it is clear what must be included before the Options/Preferences can be saved

### ***Bug Fixes in version 3.3.3***

- Fix error which prevents the warning from being displayed when importing an incorrect file type
- Correct export links to spreadsheet so that it includes the primary link and both paths for PTP810 2+0 links
- Fix bug with the "paste sites" functionality which caused an error when pasting CSV data

### ***New or Changed in version 3.3.2***

- Add the lowest Ethernet mode to PTP600 products
- New functionality to import links from CSV file
- Include the 30 MHz bandwidth for 4.5 GHz NTIA
- It is now possible to edit multiple antenna height values in the Links page
- Rename FCC (Extended) to FCC (Rural) and update the warning message to reflect the new FCC regulations
- Change 6 GHz "Cat B" licenses to "Cat B1" to reflect the new FCC regulations
- PTP250 has preliminary support for additional licenses in the 5.8 GHz band
  - Finland, Greece, Iceland, Liechtenstein, Portugal, Serbia, Switzerland
- PTP600 ATEX/HAZLOC supports additional licenses in the 5.8 GHz band

- Finland, Greece, and Portugal

### ***Bug Fixes in version 3.3.2***

- Correct the reported installation receive power during alignment for protected links
- Update the max EIRP values:
  - 5.8 GHz - Bahrain, Bahrain, China, Denmark, Denmark, ETSI, Finland, Germany, Greece, Iceland, Ireland, Liechtenstein, Portugal, Serbia, Singapore, Spain, Switzerland, UK
  - 5.4 GHz - South Korea
- Fix bug to ensure that the correct flexible waveguide options are available for IRFU links
- Display the availability tooltip over the E1/T1 controls in the link loss summary panel
- Fix bug where transmit frequency does not reset correctly when switching band (1+1 links)
- Fix bug which caused an error when removing a user-defined antenna

### ***Bug Fixes in version 3.3.1***

- APC option must be disabled when the Link Type is 2+0 XPIC
- 2+0 XPIC is not available at 18 GHz/ETSI

### ***New or Changed in version 3.3.0***

- Add E1/T1 support to PTP810
- Incorporated ETSI Minimum Rated Transmit Power
  - Increases minimum transmit power level by 5 dB for ETSI regions, for short links enable ATPC
- Introduce ATPC/APC selection, which increases maximum transmit power setting on short links to optimize fade margin
  - Receive power levels at installation increased to a maximum of -20 dBm, operational receive levels keep the same upper limits
- New 5.8 GHz licenses for PTP500/PTP600
  - Finland, Greece, Iceland, Liechtenstein, Portugal, Serbia, Switzerland
- Added support for equipment templates

- Multiple equipment templates can be defined to control the configuration of new links
- Equipment templates can now include BOM optional extras
- Replaces the default settings for new links
- Create links by pasting data from a spreadsheet
- MOL export no longer supported
- Removed Summit switches from optional extras

### ***Bug Fixes in version 3.3.0***

- Fix the links to help file on OSX
- Fixed a problem which limited the available PTP810 modulation modes
- Project templates now load correctly
- If an error occurs when exporting a map to a PDF, LINKPlanner no longer tries to open the file
- Select the correct flex twist hanger in the BOM for 11 GHz
- Updated 11 GHz Dual Pol with OMK antennas to include FCC Cat B (2ft) and Canada 310.7B (4ft)

### ***New or Changed in version 3.2.2***

- Introduce PTP 810 2+0 with link aggregation, including 2+0 XPIC
- Introduce PTP 810 Capacity Keys
- Add automatic MMU selection to BOM for PTP 810
- Additional optional extras
- New unlicensed antennas
- New Encryption option in the equipment settings for PTP 250
- PTP 250 now uses the Cambium part numbers
- Rename PTP 800 Maximum Tx Capacity Limit to "400 Mbps"

### ***Bug Fixes in version 3.2.2***

- Fix bug which prevented the project from being exported to Google Earth if a formatting rule excluded any of the links from the export

- Correct PTP 300/500 Capacity License Key descriptions

### ***New or Changed in version 3.2.1***

- Change the antenna manufacturer to Cambium Networks
- Update 1ft and OMK antennas part numbers
- Remove preliminary status from PTP11800i with IRFU-HP
- Updated parts list for PTP 810

### ***Bug Fixes in version 3.2.1***

- Update the BNC Voltage algorithm in line with the PTP 800 User Guide

### ***New or Changed in version 3.2.0***

- Introduce Preliminary PTP 810 planning capability for 1+0 and 1+1
- Support System Release PTP 500-05-00 including consolidation of PTP 300 with PTP 500
- Remove Preliminary Status from PTP 800 Spatial Diversity
- Remove Preliminary Status from 6 GHz IRFU
- Update 11 GHz 4ft antennas to support Canadian regulatory compliance
- Introduce the capability to display sales and support contact information in LINKPlanner
- Introduce the capability to display news information in the welcome page
- Updated Licensed Band Switch part numbers

### ***Bug Fixes in version 3.2.0***

- Corrected FCC 7 GHz 25MHz bandwidth emission designator
- Fix bug in VB availability calculations for links with negative fade margins
- Fix project tree refresh bug in OSX
- Correct PTP28800 minimum power output at 16QAM and 32QAM.
- Correct PTP28800 noise figure
- Trap the exception that can occur if an empty project is opened
- Trap the exceptions that can occur when starting the Google Earth icon server

### ***New or Changed in version 3.1.2***

- Updated PTP 250 FCC/IC Products to Cambium part numbers, added reference to Cambium part numbers for ETSI/RoW products
- Updated PTP 800 Long Waveguide parts to Cambium part numbers
- Updated PTP 800 installation reports
- Added antenna polarity to site installation section of licensed band reports
- Added 11 GHz 2 ft antennas to FCC regulation with Cat B compliance

### ***Bug Fixes in version 3.1.2***

- Fixed a bug in IRFU Spatial Diversity to ensure that Secondary uses the same Maximum Power and EIRP as the Primary as they share the same antenna system, only affected Non-LOS paths to diverse antenna.
- Fixed a bug in 1+0 licensed band installation reports which prevented all the antenna information being provided
- Fixed a bug in link formatting rules when testing against negative reference levels
- Fixed error that occurred when the cursor moved over a hyperlink whilst creating a link in the interactive map
- Removed Motorola from Part Number header in BOM spreadsheets

### ***Bug Fixes in version 3.1.1***

- Fix bug which prevents a project from being saved if the username contains non-ASCII characters
- Correct switch descriptions

### ***New or Changed in version 3.1.0***

- Introduce Preliminary Spatial Diversity capability for licensed
- Removed Preliminary Status from PTP 250 5.4 GHz licenses:
  - Canada
  - Guam
  - Puerto Rico
  - United States
  - US Virgin Islands
- Added optional capability for users to define a watermark for path profile images



- Included FCC 99.95% minimum payload requirement to link error status
- FCC License Coordination report now reports Cambium Antenna part number, receive end signal level and fade margin
- Added Switch selection option as an Extras tab for licensed products in the BOM

### ***Bug Fixes in version 3.1.0***

- Paste sites wasn't importing tower heights correctly in all cases
- Ensure link error status updates automatically when prediction model is switched between ITU and Vigants – Barnett
- Ensure default equipment settings are used for new links when generated through the link icon on the map
- Fixed a bug in the 1+1 Redundant Antenna BOM creation which wasn't generating correct feeder components for remote mount antennas
- Fixed unpredictable behaviour when displaying a site or panning the view

### ***Bug Fixes in version 3.0.0.rc2 BETA***

- Paste sites from Google Earth has been fixed
- The map "PDF Export" functionality works when the project has not been saved
- Fixed the export error that occurred if the link name contained a '!'
- Select the correct file extension when saving in OSX
- Remove the embedded web browser that displays the Google Map on OSX
  - This is a temporary measure until there is a suitable fix for a critical bug that causes LINKPlanner to crash on OSX
- Flexible waveguide selections for long waveguide links are now stored correctly in the project file

### ***New or Changed in version 3.0.0 BETA***

- Cambium rebranding
  - All reports now carry the Cambium Networks branding
  - New default installation location
  - Previous LINKPlanner preferences are duplicated
  - It is possible to run v3.0.0 and v2.7.0 at the same time
- Introduction of Vigants - Barnett Prediction Model

- Removed Preliminary Status from 2+0 Cross-Polar Common Dual Polar Direct Mount Antenna
- New interactive map and embedded Google Maps/Google Earth
  - Interactive map features:
    - Movable labels
    - Create links from hub (right-click on site)
    - Customisable colours and styles for links and sites
    - Export to full-page PDF
  - Embedded Google Map/Google Earth features:
    - Google Maps work on Microsoft Windows and OSX
    - Google Earth is only available on Microsoft Windows
    - Create and edit sites and links in Google Maps
- Copy and paste link path profiles
  - View and edit path profiles in a spreadsheet
- Multiple editing of links in the Links panel
  - Edit attributes for one or more links at once
- Link formatting rules
  - Create custom rules to control the visualisation properties of links
  - Use rules to control which links are included in the map, reports or in project export data
- Copy and paste links, sites and link formatting rules
  - Smart merge for when existing sites or links are similar to the data that is being pasted
  - Quickly duplicate links in the Links panel
- Project summary when you hover your mouse over the project name in the tree
  - Displays the number of sites and links in the project
- Display the reason for failure of a link in the map and on mouse-over the link in the tree
- Added detailed Feeder Loss fields to Links View

### ***Bug Fixes in version 3.0.0 BETA***

- Corrected 11 GHz Flex Waveguide Loss value for IRFU

### ***New or Changed in version 2.7.0***

- Introduce Preliminary IRFU PTP 800 planning capability
  - New FCC licenses at 7 GHz
- Updated capacity calculations for PTP-250-02-00
- New PTP 250 licenses:
  - Canada at 5.4 GHz (preliminary)
  - Guam at 5.4 GHz (preliminary)
  - Puerto Rico at 5.4 GHz (preliminary)
  - United States at 5.4 GHz (preliminary)
  - U.S. Virgin Islands at 5.4 GHz (preliminary)
  - Uganda at 5.8 GHz
- Minor changes to the PTP250 installation report
- Add ability for users to save a project as a .ptptemplate file
  - Templates can contain custom antenna information
- Add FCC Availability at Minimum Payload Capacity
- Update the available modulation modes for the FCC/adaptive in line with FCC regulation changes
- Changes to the BOM
  - Icons used to signify additional user input is required or that an item is an optional extra
  - Notes field can be edited
- New PTP 800 4ft antenna part numbers available for all regions. Previous part numbers are now obsolete.
- New antennas available at 6 and 11 GHz for Canada

### ***Bug Fixes in version 2.7.0***

- Distance ticks did not appear when displaying for 1+1 links in Google Earth
- Use the tropospheric fade margin when calculating the Annual 1-way Availability in the detailed Availability window
- Fixed a bug in the fade margin calculation for ODU-B products which was double counting the power offset in higher modulation modes, resulting in a degraded fade margin for modulation modes above lowest mode.

### ***New or Changed in version 2.6.2***

- The path profile service has been updated to use the following data sources:
  - SRTM v2.1
  - ASTER
  - GeoBase
- Add warning to link BOM panel reminding users not to order ODUs until the license has been granted
- New optional extras for PTP 600 UC-APL

### ***Bug Fixes in version 2.6.2***

- Add BNC Target Voltage to PTP 300/500 installation reports
- Correct emission designator for FCC 80 MHz bandwidth

### ***Bug Fixes in version 2.6.1***

- Update the part numbers for the 28 GHz ODU Coupler Mounting Kits
- Fix a bug that caused an error when generating a project level report if any of the links had a long waveguide

### ***New or Changed in version 2.6.0***

- Support system release PTP800-04-00:
  - 2+0 support
  - Added NTIA regulation to 7 and 8 GHz
  - ETSI 32 GHz is no longer preliminary
  - Added ETSI 28 GHz
  - Added support for ODU-B at 11, 18 and 23 GHz
  - Introduce new part numbers for 1ft and 4ft antennas for PTP 800 in EMEA region only (available through the grayed out selection area)
- Introduce User Defined Loss field for remote antennas for PTP 800
- Introduce Long Waveguide planning option for PTP 800 at 6 and 11 GHz
- Introduce FCC (Extended) regulation to support all modulation modes for PTP 800
- Introduce additional detailed availability information for PTP 800

- PTP 800 Link Summary Performance parameter Link Availability / Lowest Mode Availability now reports 2-way Availability plus Rain
- Added additional capacity information to Performance Charts when using Adaptive Symmetry (including PTP 250)
- Added Predicted Link Loss field to PTP 800 installation reports
- Updated regulatory information for Argentina, Ecuador, Lichtenstein, Norway, Peru and Venezuela for PTP 250
- Added Export function for Performance Chart data
- Changed project navigation tree for 1+1 to support a link node and four separate paths
- Improved icons in project navigation tree to distinguish different types of links

### ***Bug Fixes in version 2.6.0***

- Updated Installation report to provide maximum value for Max EIRP rather than left end value
- Fix a bug that prevented certain KML files from being imported
- Restrict existing FCC regulation to meet FCC modulation mode capacity limits for PTP 800

### ***New or Changed in version 2.5.2***

- Added spreadsheet export function to TDD Sync window
- Added antenna beamwidth to PTP 800 installation reports
- Added clarification to receive power for unlicensed band in installation report to show it equates to transmit power during alignment
- Use neutral colours for the performance charts

### ***Bug Fixes in version 2.5.2***

- Added coupler losses for Hot Standby into “Common Loss” field in FCC License Coordination report
- Removed obsolete tag from 2ft antennas at 32 GHz
- Include 3ft antennas for 15 GHz Mexico regulation
- Remove 3ft antennas for 11 GHz Canada regulation
- TDD Sync warning no longer appears when the settings are valid

### ***New or Changed in version 2.5.1***

- Updated regulatory information for China, India, Indonesia, Mauritius and South Korea for PTP 250
- Remove Preliminary status from PTP 800 Upper 6 GHz FCC regulation
- Incorporate Canada regulation into PTP 800 38 GHz
- Automatically include radome for 6 GHz 10 and 12 foot antennas in BOM and incorporate radome loss into performance calculations
- Add information note when first activating TDD-Sync to link to settings page
- Include additional installation items in BOM extras

### ***New or Changed in version 2.5.0***

- Support for the PTP 250 unlicensed product in 5.4GHz and 5.8GHz bands
- Display Predicted Receive Power in the Performance Summary section
- Change the order of Product and Regulation selections in the Equipment panel
- Change the Path Length calculations from spheroid to ellipsoid.  
**NOTE:** This results in slight changes to the path length (less than 0.5%) and may result in small changes to the Predicted Availability
- Added capability to export the BOM for a single link to a spreadsheet
- Added capability to configure prioritized list of default licenses for each band
- PTP 800 Installation Reports updated to indicate which ends are Hi and Lo

### ***Bug Fixes in version 2.5.0***

- Change Maximum Receive Power limit to -35dBm (from -30dBm) for PTP 800.  
**NOTE:** This may cause some very short links to display errors that in previous versions appeared to be OK
- Updated “Max User IP Throughput in either Direction” in Installation Reports to show the maximum value, rather than the value for one end.

### ***New or Changed in version 2.4.1***

- Support 322MHz T/R spacing at 15GHz for ETSI regulations
- Display data rates and availabilities in tooltips on performance charts
- Include performance charts in reports
- Add Full Power regions for OOBM variants of PTP600

### ***Bug Fixes in version 2.4.1***

- Fix part numbers for Upper 6GHz ODUs for FCC regulations
- Fix 2 bugs that prevented certain KML files from being imported
- Ensure that the main window doesn't appear off-screen on startup
- Fix a bug that could cause the power limit warning to be displayed at the wrong time.

### ***New or Changed in version 2.4.0***

- 1+1 Hot Standby support for PTP800
- ATEX/HAZLOC support for PTP600
- Import profiles from Pathloss
- Facility for modifying quantities and adding accessories to the Bill of Materials for a link
- Clearer warnings when a link is planned at 5.4GHz near a TDWR radar location. The warnings are also included in reports.
- Include PTP800 power supply (for converting 110/230V to 48V) by default in the Bill of Materials
  - **Please note that you must select a region on the Options/Bill of Materials page in order to get the correct part number for the power cable.**
- Support for FCC at Upper 6GHz, and increase the number of modulation modes available for FCC and Industry Canada at Lower 6GHz and 11GHz
- "Notes" column in the Bill of Materials that displays information about certain items (such as whether they are obsolete)

### ***Bug Fixes in 2.4.0***

- Fix bug during report generation when using 60MHz channel separation in ETSI Upper 6GHz
- Don't allow 2ft antennas at 11GHz in FCC regulations
- Warn when trying to open a profile as a project, and vice-versa
- Fix a bug in the profile chart when reversing a link

Please note that the contact address for link planner questions is now [linkplanner.ptp@motorolasolutions.com](mailto:linkplanner.ptp@motorolasolutions.com)

### ***Bug Fixes in 2.3.10***

Version 2.3.10 fixes 2 issues that were introduced in version 2.3.9

- Fix 3 antenna part numbers
- Fix an issue with using PTP59600 in the 5.8GHz India regulation (region 19)

### ***New or Changed in version 2.3.9***

- Introduce new 2ft and 3ft antennas for PTP800, and retire older 2ft and 2.5ft antennas.
- Introduce new part numbers for PTP300/500/600 in USA and Canada
- ETSI Upper 6GHz is no longer preliminary

### ***Bug Fixes in 2.3.9***

- Prevent the link panel from getting unnecessarily wide on Mac OS X

### ***New or Changed in version 2.3.8***

- Add Mexico as a supported region at 5.8GHz and 5.4GHz, using the Out Of Band Management variant of PTP-600

### ***New or Changed in version 2.3.7***

- Support system release PTP500-04-00:
  - TDD Sync using PTP-SYNC
  - New region code for Spain at 5.8GHz
- Support system release PTP800-02-04:
  - 60MHz channel separation in ETSI Upper 6GHz
  - FCC 26GHz is no longer preliminary
  - New 8GHz channel pair at 311.32MHz T/R spacing
- Include PTP800 links using adaptive modulation in FCC Coordination output
- Include the FCC database of TDWR (weather radar) stations. A warning will be displayed for links operating at 5.4GHz within 35km of a TDWR station; steps must be taken by operators to ensure that they do not interfere with these radars.
- Include charts of throughput against availability in the Performance Details



### ***Bug Fixes in 2.3.7***

- PTP800:
  - 32QAM for 32GHz at 7, 14 and 56MHz bandwidths
  - 7 and 14MHz bandwidths for Upper 6GHz
  - Reduce power for 32QAM in Upper 6GHz and 32GHz
  - Restore bandwidths which were removed in version 2.3.5

### ***Bug Fixes in 2.3.6***

- Fix a bug which caused antenna gain on some links using PTP300/400/500/600 with integrated antennas to be calculated incorrectly (possibly as much as 5dB low at each end)

### ***New or Changed in version 2.3.5***

- Support system release PTP800-02-02
  - Add regulation definition for Mexico at 15GHz with 315MHz and 644MHz T/R spacings
  - 38GHz FCC and 8GHz ETSI are now officially supported regulations (they are no longer preliminary)

### ***Bug Fixes in 2.3.5***

- 38GHz ETSI QPSK max power increased by 1dB
- 38GHz/700MHz (FCC) max power and sensitivity each reduced by 1dB
- PTP800 Bandwidths are now restricted based on T/R spacing – some previously available combinations were actually not supported and have now been removed
- All PTP800 T/R spacings other than 252.04MHz and 311.32MHz must use frequencies that are multiples of 250kHz. This was not always enforced in previous releases
- Removed the ability to select PTP800 transmit frequencies that aren't separated by the selected T/R spacing.

### ***New or Changed in version 2.3.4***

- Add regulation definition for Spain at 5.8GHz, which will be supported by PTP58600 in the upcoming 09-01 system release
- Enable 256QAM and 64QAM0.92 in 5MHz channels on PTP48600 and PTP49600

### ***Bug Fixes in 2.3.3***

- Fix a bug that prevented creation of custom antennas introduced in version 2.3.2

### ***New or Changed in version 2.3.2***

- Support for PTP800 system release 02-01
- ETSI region for 15GHz and 13GHz is no longer considered preliminary
- Added Single/Dual payload control for PTP600

### ***Bug Fixes in 2.3.2***

- Don't display Spatial Diversity in reports for PTP800
- Display a consistent antenna gain in reports even when no transmit frequency has been selected.

### ***Bug Fixes in 2.3.1***

- Fix a bug that could cause PTP-600 not to display any dual-payload modulation modes

### ***New or Changed in version 2.3.0***

- Add support for Adaptive Modulation for PTP800
- Allow multiple links between the same pair of sites

### ***Bug Fixes in 2.3.0***

- Include Link BOM rather than Project BOM in installation report
- Adjust tolerance of timing errors for PTP-SYNC
- Updated part number for 7/8GHz waveguides
- Fix coordinates in FCC Coordination output file

### ***New or Changed in version 2.2.0***

- Add support for PTP-800 in the following bands and licenses:
  - 38GHz: FCC, ETSI
  - 32GHz: ETSI

- 26GHz: FCC
- 18GHz: Brazil
- 15GHz: ETSI
- 13GHz: ETSI
- 8GHz: ETSI
- 7GHz: ETSI
- Upper 6GHz: ETSI
- Lower 6GHz: FCC, Canada, ETSI

Some of these are marked as preliminary and will not be supported by PTP800 until a later date.

- Add PTP-SYNC as an alternative TDD Synchronization mechanism for PTP600
- Add submenus in column chooser
- Fix problems with non-ASCII characters in report filenames
- Fix issue with rain calculation in very dry parts of the world (eg. Egypt or Antarctica)

### ***New or Changed in version 2.1.0***

- Support for the PTP-800 product range in ETSI at 11GHz
- Fixed an error with the BoM for PTP-600 with E1/T1 selected
- Changed from Chmox to iChm as the recommended help reader for Macintosh
- Added the ability to reverse a link
- Removed the distance markers from links except for the selected link

### ***New or Changed in version 2.0.0***

- Support for the PTP-800 product range in licensed bands
- Calculate the effects of rain and atmospheric absorption (ITU-R P.530 and supporting standards)
- Display a Bill of Materials for a link and also for a project as a whole

### ***New or Changed in version 1.6.0***

- Support PTP-600 system release 08-03
  - NTIA region code for PTP48600 and PTP45600
  - Increased performance in 20MHz channels

- New TDD sync burst and frame durations
- Increase power limit to 23dBm in all bandwidths for PTP25600
- List all PTP-400 products as “retired”.
- Improved modelling of PTP-600 hardware. This means that calculated results may differ slightly from previous versions of the LINKPlanner.

### ***Bug Fixes in 1.6.0***

- Fix for occasional error when generating reports if link names contain non-ASCII characters
- Fix for occasional error when changing report font or paper size
- Fix for error when using E1/T1 on PTP54300 in line-of-sight mode
- Fix for AVA5-50 and LDF4.5-50 cable types not being saved correctly

### ***New or Changed in version 1.5.0***

- Support for PTP-500 and PTP-300 software 03-02. Includes E1/T1 support and “Line-of-Sight” mode for PTP-300.
- Add “Unregulated” license for PTP25600 that allows 30MHz channel bandwidth
- Double-click or use the mouse wheel to zoom in and out of the project map.

### ***Bug Fixes in version 1.5.0***

- Correct the cable loss displayed in reports
- Correct the attenuation of the AVA5-50 and LDF4.5-50 cable types
- Reduce EIRP limit from 51 to 50dBm for PTP49600 and PTP48600 in USA and Canada
- Increase EIRP limit of PTP49400 to 49dBm and increase power output in lower modulation modes by 2dB
- Reduce maximum power output of PTP58600 from 34 to 33dBm in China

### ***Bug Fixes in version 1.4.1***

- Fix a bug that prevents the use of 5MHz channels in PTP48600 and PTP49600

### ***New or Changed in version 1.4.0***

- Added TDD Synchronization for PTP600.

- Added pan and zoom capabilities to the project map, and the ability to create a links between sites directly from the map.
- Added Radio Waves antennas in the 4.4-5.0GHz range.
- Installation report now contains all relevant parameters in the order they appear in the equipment's Installation Wizard.
- Added AVA5-50 and LDF4.5-50 Heliac cable types.
- Don't register the ".dat" file extension to the link planner any more. The path profile system now sends ".ptpdat" files.
- Rename "Link Availability" to "Lowest Mode Availability", which is a more accurate description.

### ***Bug Fixes in version 1.4.0***

- PTP49600 no longer supports 256QAM and 64QAM 0.92 modulation modes in 5MHz channels.
- PTP49600 was incorrectly using 27dBm maximum power, rather than 24dBm. Please note that if you have planned links using the incorrect power, you should check those links in the new version to ensure that they still meet your requirements.
- Fix a couple of bugs when importing KML and CSV files.

### ***Bug Fixes in version 1.3.1***

- Project proposal reports no longer repeat information for the same link over and over again.

### ***New or Changed in version 1.3.0***

- Reports are now in PDF format by default. PDF is more convenient and produces better quality printed output. When exporting a report, you can still select HTML in the "Save As" dialog if necessary.
- Reports separated into "Installation Reports" and "Proposals". Installation reports contain detailed configuration and performance parameters. Proposals offer a more general overview.
- Allow for custom (user-defined) fields. These can be assigned to projects, sites, links and "ends".
- Panels may now be detached from the main window. For example, this allows you to open multiple links at the same time, or to view the project overview at the same time as an individual link.
- Update throughput and latency calculations for PTP-600 release 08-01

- When a link is configured for telecoms traffic, display the kind of payload each modulation mode is able to carry.
- Add Hong Kong region code for PTP49600
- Add PTP48600
- For PTP-600, allow narrow channel bandwidths to be selected in regions that require radar detection.

### ***Bug Fixes in 1.3.0***

- Fix incorrect latency calculations when using 16QAM 0.63 Single as the lowest telecoms mode.
- Don't allow "Adaptive" symmetry for PTP-600 in 5MHz channels.

### ***New or Changed in version 1.2.0***

- Update the PTP49600 support with the final equipment capabilities (20MHz channel bandwidths, 256QAM available in all bandwidths)
- When E1 or T1 interfaces are selected (PTP-600 only), display the latency and expected availability, and change the throughput numbers to reflect the IP throughput remaining. There is a new equipment configuration parameter ("Lowest Telecoms Mode") that can be changed to affect the latency.
- Add new data rate calculations and features for PTP-600 release 08-00.
- Add a 'Project description' field on the main Project page.
- Make the map and profile panels resizable (click and drag the bottom edge of the panel)
- Split the equipment panel into two sections, so that the main window isn't forced to be too wide. The first section is for equipment selection, and the second for configuration.

### ***Bug Fixes in 1.2.0***

- Don't allow 30MHz channel bandwidth on PTP25600. If you load a project that was using this setting (even if only for the "Default settings for new links"), you will receive a warning when you load the project saying that "30 is not a valid 'bandwidth' value". Those links will be changed to 15MHz bandwidth.
- Fix the regulatory definitions for Korea. Links using that region may display different data rates.
- Adjust the definition for 256QAM 0.81 Dual when optimised for TDM. Predictions for links that would spend a lot of time in the top-rate modes may be reduced slightly.

### ***Bug Fixes in 1.1.1***

- Fix a few problems with non-ASCII characters in operating system and web proxy error messages.
- Detect corrupted Google Earth file associations and display a more helpful error message.
- Fix a crash on startup if the user's Windows Profile contains non-ASCII characters.
- Fix the performance details display for PTP-500 when in Adaptive mode.
- Fix the 'This antenna is not allowed in the current region' message, which appeared more often than it should have done.

### ***New or Changed in version 1.1.0***

- Compatible with PTP500 and PTP300 software version 03-00.
- Sort tables of links and sites by clicking in the column headers.
- Improved Hydra import.
- Colour links red in the tables, navigation tree, and map display when they do not meet their requirements.
- Edit some attributes of links and sites directly in the table (name and description).
- Allow deleting of sites and links from the tables via a context (right-click) menu.
- Antenna selection list now has separate columns for manufacturer, description, part number, diameter, and whether it is dual-polar. The list can be sorted by any of these attributes.
- New panel for managing custom antennas.
- Change the preferences dialog to use a tabbed layout. Add a section where the user can choose their default licenses for each region. Also add a 'Test Network Settings' button.
- When launching external files (such as KML and CSV), detect if no application is associated with that file type and suggest an appropriate application.
- Preview profiles between sites in Google Earth before creating links

### ***Bug Fixes in 1.1.0***

- Account for frame overhead in PTP500 and PTP300 data rates (causes a very small reduction in throughput).
- Import sites from KML files that use the 'Schema' tag (generated by Google Earth Pro when importing data from a delimited text file).

- Fix the part numbers for certain High Performance Radio Waves antennas.
- Reduce the output power for short links (may reduce throughput calculations for short links)

### ***New or Changed in version 1.0.3***

- Improved CSV import support. The link planner should now be able to import a much wider range of 'delimited text files' (not just CSV). It also should be able to cope with encodings other than ASCII.
- Enable pasting of sites from spreadsheets.
- When editing a profile, the user can add and delete points.
- Add PTP49600 to allow pre-planning of PTP49600 networks. (PTP49600 is planned to launch at the end of Q4/08)

### ***Bug Fixes in 1.0.3***

- In the report, the diversity spacing is now displayed in the user's chosen units.
- Fix importing of certain KMZ files.
- Fix power limits for PTP-500 and PTP-300 using narrow bandwidths at 5.8 GHz in UK, ETSI, Germany and Denmark regions, and at 5.4GHz in ETSI, FCC, Australia and Canada.
- Don't allow narrow bandwidths for PTP-500 and PTP300 at 5.8GHz in China, Australia, Singapore, Korea, India, Thailand and Bahrain. Please note that if you were previously using a narrow bandwidth in one of these regions, you will receive a warning when you load a project that the previous bandwidth value was not valid.
- Reduce some of the flicker when expanding and collapsing parts of the link display.
- Fix the "value XXXX exceeds value of control" messages that some people have experienced when using large numbers for the maximum antenna height.
- Fix double-clicking on a row in the sites table. Previously, the correct site was not always selected.
- Fix sensitivity of PTP45600 in narrow bandwidths.

### ***New or Changed in version 1.0.2***

- Rename 5.9GHz 'Unregulated' license to 'Full Power'



### ***Bug Fixes in 1.0.2***

- Fix PTP-500 and PTP-300 data rate for long links.

### ***New or Changed in version 1.0.1***

This is a bug fix release and thus there are no major new features, minor features are;

- Startup tips.
- Improved 'New Version' indicator.
- New Radio Waves antennas.
- Get Profile indicator.
- Better handling of missing or locked files.
- More informative error handling when getting profiles.

### ***Bug Fixes in 1.0.1***

- Make the LINKPlanner work on older PC CPUs that don't support SSE2 instructions (eg. Pentium 3).
- Fix an error in the PTP58600 power limit in ETSI and Denmark.
- Stop opening URLs twice on Windows.
- Use the correct path separator in HTML reports on the PC to enable the reports to be moved to other platforms.
- Correct the Link Availability in the HTML report and improve the layout for the installation section.

### ***New or Changed behaviour in version 1.0.0***

PTP300, PTP400 and PTP600 support. It also supports the complete range (licenses and Lite) of PTP500 products. PTP600 TDD sync is not yet supported.

- When needing to change obstructions through multiple points (eg. for a forest) then select the region, type a value and press enter to put that value in the selected cells.
- A reflection calculator enables optimum diversity spacing to be selected to mitigate reflection from horizontal reflecting surfaces such as lakes and sea.
- Warnings for large antenna size in certain licenses
- Added progress bars to reports and exports.
- Support for the kmz file type for import and export from Google Earth. The ends of links now have descriptions in Google Earth.

- Support for copy and paste of locations from Google Earth to LINKPlanner.
- Support for editing multiple profile points at once by selecting them, typing a number and then pressing Enter.
- Version for the Intel Mac.

### ***Bug Fixes in 1.0.0***

- Fix that prevented the menu File->Exit from working properly.
- PTP500 powers to be used during installation were incorrect for short range and radar detection regions.
- LINKPlanner failed to start if the user name contained non-ASCII characters
- KML files contained and altitudemode rather than altitudeMode causing problems in older versions of Google Earth
- File->Exit did not work when there were unsaved changes.

### ***New or Changed behaviour in version 0.6***

- Google Earth display: The Google Earth display has been improved in the following ways:-
  - It includes Ground Fresnel zones, Vertical Fresnel zones and range markers
  - Clicking The Google Earth toolbar button when a link is selected zooms and centers to that link with the local on the left and remote on the right
  - Clicking the Google Earth toolbar button when a Site is selected zooms to the links connected to that site with the site in the center
- Installation Report: The installation section of the Link Report is enhanced to include recommended power settings during pointing and post installation. It also adds the recommended tilt of the antenna.
- Maximum Height: The maximum height for a site can be empty and it will be ignored. When defined it becomes an advisory limit for the antenna height above ground.
- Compatibility with Excel: CSV output is now encoded as UTF-16 little-endian, with TABs as field separators. This provides improved compatibility with Excel when regional settings are not English.
- Online Help: The user manual is now available in CHM format giving faster access to the features of the LINKPlanner.

## ***Bug Fixes in 0.6***

Map and profile displayed boxes for characters when using a non-english region: There is now improved support for non-Latin character sets. If boxes are displayed instead of text on the Map and Profile charts, install one of these two fonts:-

- ☐ Arial Unicode MS ([http://en.wikipedia.org/wiki/Arial\\_Unicode\\_MS](http://en.wikipedia.org/wiki/Arial_Unicode_MS)). This is optionally installed as part of Microsoft Office.
- ☐ Bitstream Cyberbit ([http://en.wikipedia.org/wiki/Bitstream\\_Cyberbit](http://en.wikipedia.org/wiki/Bitstream_Cyberbit))
- Antenna Heights (feet) scaling problem: The scaling problem, which made it difficult to use feet for antenna heights, has been fixed.
- TDM Data Rate Calculation: The data rate is now calculated correctly when TDM mode is selected.
- Errors when importing .dat files: The dat file import process has been corrected.

## ***Known Issues***

The following issues apply to this version of the LINKPlanner.

- Worst earth calculations are not present. The 99.99% worst earth curvature is shown on the graph. Links less than 10km are not affected, links longer than 10km with a clear line of sight including worst earth are not affected. Links, which are affected, will operate with a slightly degraded reliability relative to the LINKPlanner results presented.
- KML files may fail to open when two versions of Google Earth are installed.
- Importing dat files from versions of the Link Estimator older than 8.2 may fail. Work around is to upgrade to 8.2, and load the dat file and re-save the dat file in the new format.

## ***Installation Notes***

The PTP LINKPlanner is provided as a self installing executable file for Windows. The install process is described in the User Manual.

The Intel Mac version is provided as a disc (dmg) image. A README document within this image describes a three stage installation process.